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WHITHER MEDICINE?*

BY

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Although this Society is not amongst the older-established medical societies of London yet it has, during the 67 years of its existence, attained a high status, following closely the rapid development of the hospital and nurses' training school at Hammersmith. The influence of these medical societies upon the history of our Science and Art is very great, and the contribution made by the West London Society is considerable.

When I was very kindly invited to speak to the Society I was given free choice of subject as between, say, some clinical theme about which I might reasonably convince others, if not myself, that I had had experience, or some aspect of the very topical subject of Medicine in relation to the State. Pressed for a title, I stated it to be " ? A Guild for Doctors " ; and I shall have something to say on that subject. But I have decided to take a larger view of the present situation in our relations with authority, and so I later suggested for my title " Whither Medicine ? " The change was influenced somewhat by the knowledge that the Council of the B.M.A. is itself at this moment considering very seriously the desirability of setting up a Guild of doctors which shall be able to impose sanctions which are not free from legal obligations if imposed by the Association itself. Whether such a body will be actually formed, and, if so, of what nature it will be, is for the time being unknown. It is, however, significant that such a step should be definitely contemplated.

In actual fact the profession of Medicine was never a proper Guild in this country. The nearest thing to a Guild was the Barber Surgeons Company, whose history is sufficiently well known to us all. Its natural successors have been the Royal Colleges and the Society of Apothecaries. But the word " guild " has been used symbolically from time to time, as in an address by Osler to the Canadian Medical Society fifty years ago. In that address Osler spoke of four great features of the Guild of Medicine—its noble ancestry, its remarkable solidarity, its progressive character, and its singular beneficence.

A Beneficial Influence

In dilating on the first of these features—*the origins of Medicine*—Osler quotes Gomperz, who pays homage to the Greek School of Medicine because it very early brought the spirit of criticism to bear upon the arbitrary and superstitious views of the phenomena of life that held sway at that time in the world's history. By introducing quiet methodical research into the domain of the physician's art it exercised a most beneficial influence on the whole intellectual life of mankind.

" The critical sense and sceptical attitude of the Hippocratic School laid the foundations of modern Medicine on broad lines and we owe to it : *first*, the emancipation of medicine from the shackles of priestcraft and of caste ; *secondly*, the conception of Medicine as an art based on accurate observation, and as a science, an integral part of the science of man and of nature ; *thirdly*, the high moral ideals, expressed in that most ' memorable of human documents ' (Gomperz), the Hippocratic oath ; and *fourthly*, the conception and realization of medicine as the profession of a cultivated gentleman. No other profession can boast of the same unbroken continuity of methods and of ideals. We may indeed be justly proud of our apostolic succession. Schools and systems have flourished and gone, schools which have swayed for generations the thought of our guild, and systems that have died before their founders ; the philosophies of one age have become the absurdities of the next, and the foolishness of yesterday has become the wisdom of to-morrow ; through long ages which were slowly learning what we are hurrying to forget—amid all the changes and chances of twenty-five centuries, the profession has never lacked men who have lived up to these Greek ideals."

Concerning the solidarity of Medicine Osler says:

" Of no other profession is the word universal applicable in the same sense. . . . It is not the prevalence of disease or the existence everywhere of special groups of men to treat it that betokens this solidarity, but it is the identity throughout the civilized world of our ambitions, our methods and our work. To wrest from nature the secrets which have perplexed philosophers in all ages, to track to their sources the causes of disease, to correlate the vast stores of knowledge, that they may be quickly available for the prevention and cure of disease—these are our ambitions. To carefully observe the phenomena of life in all its phases, normal and perverted, to make perfect that most difficult of all arts, the art of observation, to call to aid the science of experimentation, to cultivate the reasoning faculty, so as to be able to know the true from the false—these are our methods. To prevent disease, to relieve suffering and to heal the sick—this is our work. The profession in truth is a sort of guild or brotherhood, any member of which can take up his calling in any part of the world and find brethren whose language and methods and whose aims and ways are identical with his own."

Of the progressive character of Medicine Osler says:

" Based on science, medicine has followed and partaken of its fortunes, so that in the great awakening which has made the nineteenth memorable among centuries, the profession received a quickening impulse more powerful than at any period in its history. With the sole exception of the mechanical sciences, no other department of human knowledge has undergone so profound a change—a change so profound that we who have grown up in it have but slight appreciation of its

* A dinner-address to the West London Medico-Chirurgical Society on Feb. 18.

momentous character. And not only in what has been actually accomplished in unravelling the causes of disease, in perfecting methods of prevention, and in wholesale relief of suffering, but also in the unloading of old formulae and in the substitution of the scientific spirit of free inquiry for cast-iron dogmas we see a promise of still greater achievement and of a more glorious future.

"And lastly, the profession of medicine is distinguished from all others by its *singular beneficence*. It alone does the work of charity in a Jovian and God-like way, dispensing with free hand truly Promethean gifts.

"There are those who listen to me" (continued Osler) "who have seen three of the most benign endowments granted to the race since the great Titan stole fire from the heavens. Search the scriptures of human achievement and you cannot find any to equal in beneficence the introduction of Anaesthesia, Sanitation, with all that it includes, and Asepsis—a short half-century's contribution towards the practical solution of the problems of human suffering, regarded as eternal and insoluble. We form almost a monopoly or trust in this business. Nobody else comes into active competition with us, certainly not the other learned professions which continue along the old lines. Every few years sees some new conquest, so that we have ceased to wonder. The work of half a dozen men, headed by Laveran, has made waste places of the earth habitable and the wilderness to blossom as the rose. . . . There seems to be no limit to the possibilities of scientific medicine, and while philanthropists are turning to it as to the hope of humanity, philosophers see, as in some far-off vision, a science from which may come in the prophetic words of the Son of Sirach, 'Peace over all the earth.'

"Never has the outlook for the profession been brighter. Everywhere the physician is better trained and better equipped than he was twenty-five years ago. Disease is understood more thoroughly, studied more carefully and treated more skilfully. The average sum of human suffering has been reduced in a way to make the angels rejoice. Diseases familiar to our fathers and grandfathers have disappeared, the death rate from others is falling to the vanishing point, and public health measures have lessened the sorrows and brightened the lives of millions. The vagaries and whims, lay and medical, may neither have diminished in number nor lessened in their capacity to distress the faint-hearted who do not appreciate that to the end of time people must imagine vain things, but they are dwarfed by comparison with the colossal advance of the past fifty years."

I make no apology for this long quotation from Osler's address. My reason for introducing it is that I wanted to establish at the outset the basic qualities of the great science and art to which we have sworn allegiance. Because, whether we have taken the actual Hippocratic oath or not—and some of us have—we have surely consecrated ourselves and our lives to Medicine in one or other of its branches. And I could not myself state these basic qualities half so well as they were set forth in the passage I have just quoted.

Straight Ahead!

But if Osler could stake out so splendid a claim for Medicine in 1902, what could he not have done to-day, after nearly fifty more years of breath-taking progress? I remember well, only three years after he gave this Montreal address, he came excitedly into my room straight from Rome, where he had just seen Schaudinn's staggering demonstration of the spirochaete in the lesions of syphilis.

Think what has happened since then. The discovery of radium, the rapid development of *x*-ray diagnosis and treatment, the recognition of the vitamins, the synthesis of the sex hormones, the introduction of psycho-analysis, the preparation and getting under control of the sulphonamides, of penicillin, and of other antibiotics—this is to name only some of the major additions to the progress of Medicine made during the past half-century, despite two long interrupting world wars.

Very good. A man from Mars, looking on and being ignorant of the queer lapses of the earthly human mind into unintelligence, would think the question that I have taken as the title of this talk to you itself unintelligent. "*Whither* Medicine?" he would say. "Why, whither else than straight ahead; forging still more weapons with which to conquer disease, taking still more toll of science in the interest of humanity, adding more and more culture to more and more learning, improving both the art and the craft. Medicine has really only just begun its task. It has tackled, and, as you say, not unsuccessfully, the simpler and grosser causes of bodily disablement. You don't die any more in swathes—from smallpox, or plague, or even typhoid fever. Though you don't live longer, more of you live to old age than you used to do. You have got a lot of diseases under control. But I see no decrease as yet in the number who fall victims to what you call high blood-pressure and cardiovascular degeneration. Nor any lessening of the psychoneuroses. Indeed, both of these groups of your patients seem to be increasing in number. And as for the spirit of man, rather than his body, have you even begun to tackle that? Forgive this little criticism," concludes our Martian friend, "but the answer to your question, 'Whither Medicine?' is as I say, 'Straight ahead.'"

And this is surely the answer that every thinking man and woman of us will also give. Why, then, does the question arise? I want to try to answer this further question.

Emergence of the Individual

At this point we have to consider what our American friends are fond of calling "the changing order." On analysis, the salient feature of this "changing order" seems to be the emergence of the individual in Society. This emergence has synchronized with a number of profound alterations in the way of living and in social attitude. Among these are industrial expansion, poverty, the rise of big business and big government, the arrival of social service, and the development of voluntary health insurance plans.

There are two even more basic elements in this concentration upon the individual which is the fundamental feature in the changing order. The first is recognition of the fact that the citizen himself, and not his goods and chattels or the want of them, constitutes the real wealth or poverty of a nation. Thinking men have told us this again and again. (You remember the old cliché: "The health of its citizens is a nation's greatest asset.") But we did not listen until dire national peril was upon us. During the recent war we passed our men and women through a finer comb than we had ever done before, and now, in the post-war era, man-power is the commodity we find in shortest supply.

The second basic element leading to the emergence of the individual is his own spiritual evolution. That the evolution of personality proceeds along lines which tend to help humanity forward is generally accepted. In the course of this advance the individual very reasonably says to Medicine, "What can you do for me?"

The Medical Ideal

Now although it is true that, being based upon Science, Medicine, to be really progressive, should command a degree of autonomy—of freedom—there is agreement that its full powers should be applied to the attainment of the health and happiness of the individual. In so far as the State acts wisely in the interests of the citizen, this desideratum has always been recognized. At first it was recognized only dimly, but later more clearly. There has to-day opened

up for the statesman, the sociologist, and the physician a large field for their inquiry and their action, and this field is common ground. The man of Medicine must not spend all his time in this field; he must go apart, whether in the laboratory or at the bedside, or, like Harvey, walk under the trees rapt in thought so that by observation, by experiment, and by contemplation he may keep Medicine dynamic. For it is *through Medicine* that he makes his contribution, a contribution which no one else can make. To stand aloof from the work going on in this same field is to do a disservice not only to society but to Medicine itself; but to become entirely absorbed in it is to do a disservice no less serious.

Yes, but the contribution that Medicine makes must be fitted into the social structure of the day—"fitted into," mark you, not just attached.

As Sigerist puts it, and very aptly:

"The history of the medical ideal is the history of human society. We have seen that the Greek physician was an artisan, that the Roman was a slave to begin with, and the physician of the early middle ages was a cleric, and of the latter part, a doctor. The position of the sick in society differed with every cultural epoch. So the demands upon the doctor and his position in the social structure changed constantly. Even the intellectual physician undergoes changes. He develops with advances in science. The physicians whom Molière caricatures so mercilessly in his comedies are also scholars, but their actions are grotesque because they abide by worn-out scientific ideals. The 17th century expected quite different treatment from its physicians and had a new medical ideal.

"Thus the demands made upon the physician by society in the renaissance, the Baroque period, the enlightenment, the bourgeoisie epochs, are different in detail, but remain the same in their fundamental claims.

"The good physician was at all times the physician who felt himself bound by the medical ideal of his time. Men like Hippocrates, Sydenham, Laennec, Billroth and Osler, were therefore great physicians and will always occupy a special position in the history of medicine, for they came closest to the medical ideal of their time. The clear understanding of the prevailing medical ideal is of great importance."

Can we achieve this end, about which we are agreed? And, if so, how? Let us suppose that we had been given the chance of helping the State by making constructive suggestions—what would these have been? In the first place there is surely consensus concerning certain basic desiderata. Medical services should provide everything that science can offer towards the preservation of health and the cure of disease; the whole corpus of knowledge, as it is termed, must be implemented in the citizen's interest. Then these benefits should be available to the entire population. Seeing that the general public has a vital interest in our plans, it should be adequately represented in their formation. But inasmuch as it is the doctor who must render the medical care, he should play the dominant part in the preparation of the scheme he will be called upon to carry out.

We should have emphasized our belief that gradual extension and improvement of medical care is preferable to revolutionary changes and that, while recognizing Government responsibility for the citizen's health, sweeping legislative action would defeat its own purpose by impairing the spirit and quality of a service which is essentially individual and personal.

Conditions for Fulfilment

As to the conditions necessary to bring about the desiderata I have enumerated, there are certain paramount criteria: the quality of medical care must be preserved; provision of public health services is essential; there must be effective use of hospitals with adequate facilities; trained professional and non-professional personnel is a *sine qua non*; optimal results require organization and co-ordination of physicians through the extension of medical groups and health centres; voluntary prepayment plans are needed; extensive education for both physicians and the public is required; the local needs of the community must be allowed for; and finally Government help, preferably by grants-in-aid, would be necessary. Indeed, a method of grants-in-aid would seem to offer the brightest promise, so far as help by a central authority is concerned.

We must realize that the practical expressions of unplanned energies are often cumbersome and wasteful. This is the price we pay for highly individualized societies. We began doing things many years ago; we did some of them so well that it has never been considered helpful to scrap them. There are parts of the machinery of our health services which work perfectly; some units stand out as pieces of perfect organization and efficiency—the large teaching hospitals, the well-run cottage hospital, some of our public health services, our Medical Research Council. It is when we come to consider the machine as a whole that organization, and therefore efficiency, are found to be unsatisfactory.

Then, lastly, to make Medicine a complete science in the service of man we must see that it infiltrates the important and now more clearly perceived sphere—as yet largely neglected—of social need. This sphere lies between that in which the diseases of the individual patient are presented to, and treated by, the individual doctor and the sphere in which the preservation of the public health is achieved by the proved methods of the Medical Officer of Health. This largely untilled field includes all the environmental factors which influence the citizen's health and happiness: his conditions of working, his home life, his sense of security or insecurity, and his ignorance of the things that make for the salvation of his body and his mind. In short, as Professor Ryle has stated: "Our next advance (in Medicine) will be . . . concerned with causes, but with the ultimate, rather than the intimate, causes of disease."

Professor Ryle's work at Oxford merits not only recognition but high praise. His term "social pathology" is an apt designation for this work. A study of the environmental factors in the aetiology of disease was overdue; it is high time that they were studied and the results statistically analysed. But when Professor Ryle says that Social Medicine is concerned with the ultimate, rather than with the intimate, cause of disease, I am sure he realizes that he is covering only a part, and not the whole, of a disease process. A disease is the resulting interaction between various extrinsic aetiological factors and the individual patient. It is always the patient that is the main factor. Hence the wisdom of Trousseau's exhortation: *Le malade, toujours le malade.*

Attention to Basic Needs

That, I think, is how we should have put the case for making our contribution to society. But we should have failed in an important part of our duty if we had not, at the same time, warned the State that if it did not attend to the more basic needs of the citizen our direct contribution from Medicine would avail little. By basic needs I mean: a sufficient amount of the proper food, suitable shelter and clothing, a satisfactory job of work, access to fresh air and sun, reasonable leisure, and the amenities of life. The doctor must stake out his claim in every one of these needs, for his is the knowledge that can guide and his is the enthusiasm that can stimulate to achievement. We physicians must lead; we must guide the politicians, since they

cannot act without expert help; we must keep the citizen's end up, since he learns to rely upon us for support.

But suppose the politician won't be guided. Suppose it is as Swift wrote in a letter to Pope: "Although I have known many great Ministers ready enough to hear opinions, yet I have hardly ever seen one that would descend to take Advice; and this pedantry ariseth from a maxim which they themselves do not believe at the time they practise it, that there is something profound in politics, which men of plain honest sense cannot arrive to." In that case the physician has no alternative but to appeal to public opinion, continuing to serve his patient in the manner which he believes to be in the patient's best interest.

Conclusion

That, I say, is how I think we should have stated our case. And so far as we had a chance of so doing, we did. It was a pity that we had no mechanism by which we could express ourselves as a corporate whole. We had no actual Guild. Following a lead by Sir Stewart Duke-Elder, some of us foresaw this plight and urged the formation of an Academy of Medicine, a body which would receive the unquestioned confidence of the Government, the people, and the profession. We failed to get support. So, scattered in different camps, we were taken off our feet. Precipitate action was the order of the day. Action, as Dr. Walshe reminded us in his recent Harveian Oration, is easier than contemplation. Many of us were bustled into this premature action against our better judgment. Almost we became politicians by *force majeure*.

I like to think that were Osler with us to-day he would resist the allurement of the song of the siren of Politics and even, if need be, order his sailors to bind him to the mast of his ship until the danger was past. It is clear to me, from talks I had with him as well as from his published essays, that an attitude of dignity and calm detachment would have characterized this great custodian of Medicine in face of the threat of political pressure.

I have more than once, in my own fashion, preached this gospel. "It is paramount that we remain detached from the general clamour . . . political clamour, the clamour of 'left' and of 'right.' For Medicine there can be no left or right. For Medicine there is only expert knowledge and a rooted adherence to truth. . . . Detachment, public confidence, courage—these are the essentials that enable Medicine to make its contribution to the common Health and Happiness."

One of the finest tributes to the heritage of which we are the trustees was that of Karl Marx: "For thousands of years," he said, "Medicine has united the aims and aspirations of the best and noblest of mankind. To deprecate its treasures is to discount all human endeavour and achievement as naught."

As a humanist I passionately want to see this great heritage placed at the disposal of my fellow men. It is a pity that the present effort of the State to bring this about has so largely failed of its purpose. It might have been a great success. We must still labour to make it so.

The work during 1947 of the Water Pollution Research Laboratory is described in "Water Pollution Research 1947," published for the Department of Scientific and Industrial Research by H.M.S.O. (price 1s. 6d., by post 1s. 8d.). The report of the Board deals chiefly with the results obtained in some of the investigations made. The report of the Director of Research gives a more complete survey of the work on the treatment of water, sewage, and industrial effluents, and on the effects of pollution of natural waters. An appendix gives references to papers published during the year in scientific journals describing some of the investigations in detail.

VENOUS THROMBOSIS AND ANTICOAGULANTS

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Venous thrombosis and pulmonary embolism are common occurrences in all branches of medical practice, and are conditions which cause prolonged disability or sudden death. In recent years both pathologists and clinicians have demonstrated that the usual site of origin of venous thrombosis is the deep veins of the calf. It has also been shown that venous thrombosis can be prevented, and that when it does occur effective treatment can be given.

This paper deals with 100 consecutive patients requiring anticoagulant treatment. They have been drawn from 17 of the 23 wards of the hospital over a period of 20 months. Its purpose is to indicate the frequency of venous thrombosis, to discuss its early clinical features, and to show that anticoagulants are an effective method of treatment.

Incidence

Venous thrombosis and pulmonary embolism occur more often in medical patients than is generally realized. In a series of necropsies on cases of pulmonary embolism Hampton and Castleman (1940) found that 60% were in medical patients and that one-half of these had suffered from heart disease.

Bauer (1946) found that, out of 804 cases of thrombosis from ten of the largest Swedish hospitals in the year 1939, 56% came from medical wards. In the present series 42.5% of the cases of thrombo-embolism were medical, 35% were obstetric, and 22.5% were surgical. The distribution of the 85 cases of venous thrombosis and pulmonary embolism, and of the 15 cases treated prophylactically, was as follows:

Aetiology of 100 Cases Treated with Anticoagulants

Treated cases of thrombo-embolism (85):	
Medical (36):	
Cardiovascular (cardiac infarction, 9; heart failure, 4; angina pectoris, 1; old apoplexy, 3)	17
Previous leg thrombosis	4
Pneumonia	3
Carcinoma	2
Axillary vein thrombosis	2
Other conditions	8
Surgical (19):	
Gynaecological (hysterectomy, 5)	7
Appendicectomy	3
Herniorrhaphy	2
Other operations	7
Obstetric (30):	
Normal delivery	9
Forceps delivery	5
Caesarean section	3
Other abnormalities of childbirth, toxaemia, post-partum haemorrhage, etc.	7
Abortion	5
Pregnancy	1
Prophylactic treatment (15):	
Myocardial infarction	7
? Developing thrombosis	5
History of previous thrombosis	3

Development of Venous Thrombosis

Most textbooks state that pulmonary emboli are secondary to thrombosis in the pelvic or femoral veins, upholding the view put forward by Virchow a hundred years ago. However, a number of workers have shown that in nearly all cases of venous thrombosis the process, although often spreading to the femoral veins, begins in the deep veins of the calf. From a series of necropsies Frykholm (1940)

concluded that the four areas of origin of venous thrombosis are: the plantar veins, the veins of the musculature of the calf, the branches of the deep femoral vein in the adductor musculature, and the visceral pelvic veins, and that of these the calf was the most frequent site.

By using phlebography Bauer (1946) has shown that venous thrombosis almost always arises in the deep veins of the lower leg, and only in about 3% of the cases in the thigh or the pelvis. He suggests that from its origin in a calf vein the thrombus spreads in the direction of the blood stream up into the femoral vein, becoming a slippery "eel-like formation, 40–50 cm. long." As venous obstruction is still only slight, the clinical signs at this stage are few, yet the patient is in great danger of the thrombus becoming detached and causing a fatal pulmonary embolism. It is probable that only a freshly formed thrombus breaks off, so that if the clotting process can be halted organization on to the vein wall will occur.

Clinical Features

Unless doctors and nurses become more "thrombosis-minded" venous thrombosis will too often remain undiagnosed until it has spread to the femoral vein and produced an obvious swelling of the leg or sudden death through pulmonary embolism has occurred. The key to effective treatment is early diagnosis while the process is limited to the calf.

Leg Thrombosis.—The patient may complain of a slight pain or cramp in the calf. Although rarely severe, it may have disturbed his night's rest. On examination there may be some swelling of the affected leg, which should be confirmed by measurement. The superficial veins may be more engorged than on the normal side. Palpation must be performed carefully, and it is best done with the patient lying with the knees half flexed and the soles of the feet placed flat on the mattress, the calf muscles thus being relaxed. Firm palpation, beginning in the popliteal fossa and working downwards, reveals a tender area, the site of the thrombosis. Local induration of the calf muscles is often felt. The plantar, femoral, and adductor regions should also be examined for local tenderness. Finally the knee is extended and the foot dorsiflexed. In the presence of deep calf thrombosis a pain in the calf is felt (Homan's sign). Quite apart from the local signs, however, the presence of an unexplained fever or tachycardia in any patient confined to bed should suggest the possibility of venous thrombosis and should lead to a thorough examination of the legs.

Pulmonary Embolism.—In a patient who develops a sudden pain in the chest with haemoptysis, and who also has venous thrombosis of one leg, the diagnosis is relatively simple. In medical patients, however, the primary heart or chest disease often obscures the true condition, and the diagnosis may be made only post mortem. Sudden onset of pleural pain is one of the commonest symptoms, but the pain may be central and mimic coronary thrombosis. Where shock, tachycardia, and cyanosis are also present the similarity may be very great. Fever, pleurisy, haemoptysis, and signs of consolidation may suggest a diagnosis of pneumonia. Sagall, Bornstein, and Wolff (1945) analysed 108 cases of pulmonary embolism and found that the clinical picture had simulated pneumonia, angina pectoris, myocardial infarction, pleurisy, vascular collapse, or acute heart failure in a large number of cases. Thus, unless the possibility of a pulmonary embolism is always considered when the above signs are present, the diagnosis may be made too late. The warning of the first attack not being heeded, a fatal embolism occurs before effective treatment is given.

In the present series leg thrombosis occurred in 74 patients, and the clinical site of origin was: deep calf veins only, 39; calf and femoral veins, 18; calf, femoral, and iliac veins, 15; and femoral veins only, 2. Of the 35 cases in which the femoral vein was involved, calf thrombosis was also present in 33. In the two cases in which femoral thrombosis alone occurred, one followed ligation of the great saphenous vein with retrograde injection, and the other case was probably secondary to thrombosis in the adductor muscles.

Plantar tenderness probably indicates thrombosis of the plantar veins, and was present in six out of 43 cases examined for it. The left leg alone was affected in 38 cases, the right alone in 31, and both together in 5.

Pulmonary embolism occurred 29 times in 27 patients. In 13 cases it was the presenting sign and in eight a complication of leg thrombosis before the start of treatment. Pulmonary embolism occurred after treatment had been started in eight cases; it will be referred to later. In 19 of the 27 patients the leg was the source of the embolism. In the other eight cases no definite source was discovered.

End-results of Venous Thrombosis

When the dangers of pulmonary embolism have passed, the patient who has suffered occlusion of the deep leg veins as a result of thrombosis faces further trouble in the years ahead. Bauer (1946) followed up 100 patients who had had deep leg thrombosis more than 10 years previously. Of these, 91 had developed indurative lesions of the leg, and in 79 ulcers had appeared. Birger (1947) found that 40% of 869 cases of leg ulcer were caused by a previous deep thrombosis.

Too often do we forget the connexion between the young mother with her puerperal thrombosis and the older woman, crippled with leg ulcers, who frequents the "varicose vein" clinic. Her legs are a perpetual source of grievance to her. She cannot do a full day's work, and her bandaged legs destroy all her social confidence. The amount of misery and time lost from work on account of these conditions is undoubtedly very great. According to Roholm (1937), in the year 1936 the sequelae of venous thrombosis cost Denmark, with a population of 3½ million inhabitants, 2 million crowns (approximately £100,000) in the value of lost working days, hospital expenses, etc.

Treatment

Prevention.—(*a*) *Active exercises* performed in bed and early post-operative walking considerably reduce the incidence of venous thrombosis. The dangers of venous stagnation in medical patients are probably even greater than in the surgical, particularly where there is a predominance of older patients and those suffering from heart disease. Old, ill, and obese patients often lie with their legs still for hours on end, providing ideal conditions for the development of thrombosis. Active leg exercises should become a routine for such patients. At each ward round the doctor should encourage them to "go for a walk in bed" at frequent intervals. In order to get the co-operation of the nursing staff, a full explanation of the need for preventing thrombosis should be given to them. They should know the clinical features of early thrombosis and should be instructed to notify the doctor immediately on finding them. Active leg exercises will not become effective unless the doctors, nurses, and patients are continually mindful of them, so that they become part of the ward routine. (*b*) *Anticoagulants*:—Both heparin and dicoumarol have been used to prevent thrombosis, but in this hospital their use has been limited to post-operative or puerperal patients giving a history of previous thrombosis, and to cases of coronary thrombosis, a disease in which thrombo-embolic complications often occur.

Curative.—Until about ten years ago deep thrombosis was always treated by prolonged immobilization of the affected leg. Unfortunately it is still a common practice, and is even advocated in several recently published textbooks. During the past few years, however, three new

methods have been tried—venous ligation, lumbar sympathetic block, and the use of anticoagulants. Each method has its supporters, and each has helped to reduce the dangers of venous thrombosis. Compared with venous ligation, the anticoagulants have the advantage of preventing the spread of thrombosis wherever its site of origin, and this may be obscure. On the other hand, they do not immediately stop emboli from occurring. Femoral venous ligation immediately prevents further emboli from arising distal to the ligation, but it does not stop thrombosis developing elsewhere, and in a few cases permanent swelling of the leg results. Lumbar sympathetic block has been used successfully to overcome peripheral vascular spasm, both venous and arterial, which accompanies the fully developed whiteleg, and in such cases, combined with anticoagulants, it is probably the treatment of choice. This treatment should rarely be necessary, since early treatment with anticoagulants can prevent the spread of thrombosis from calf to thigh, and the resultant whiteleg.

Heparin and Dicoumarol

These are the only anticoagulants in common use, and their respective advantages and disadvantages may be tabulated as follows:

Heparin	*Dicoumarol*
Difficult to administer	Easy to administer
Expensive (£2–£4 daily)	Cheap
Immediate effect	Effect delayed 24–72 hours
Few contraindications	Many contraindications
Haemorrhages rare	Haemorrhages frequent
Effect disappears in three hours	Effect disappears in 3–10 days
Coagulation times are simple to perform, and not essential	Prothrombin content estimations imperative, and require expert technicians

Indications for Anticoagulants.—(1) Deep venous thrombosis ; (2) pulmonary embolism ; (3) arterial embolism (with or without surgery) ; (4) coronary thrombosis, especially with recurrent attacks.

Contraindications to Dicoumarol.—Liver damage, renal failure, recent operations on the brain or spinal cord, subacute bacterial endocarditis, and of course disease with bleeding tendencies have all been considered contraindications to the use of dicoumarol. With normal precautions it can be safely used in the puerperium.

Method of Administration

Although the anticoagulant effect of heparin is more satisfactory than that of dicoumarol, the difficulty of prolonged intravenous administration, together with its expense, is against its routine use. In the present series the drugs have been used together, heparin being given until dicoumarol has taken effect. In most cases heparin has been given by continuous drip for 48–72 hours at a rate of 1,500 to 2,000 international units per hour. If after a few hours the coagulation time by the Lee and White method has not increased two to three times (normal 3–8 minutes in our experience) the dose is increased. In cases of pulmonary embolism an immediate initial dose of 10,000 i.u. is given. Alternatively, heparin may be given by intermittent intravenous injections of 10,000 i.u. four- to six-hourly, especially where intravenous fluids are contraindicated, as in congestive heart failure.*

Dicoumarol, 300 mg., is given when the heparin is started, and 200 mg. on the second day. The subsequent doses are regulated by daily estimations of the plasma prothrombin content (P.C.). It is important that no further dicoumarol be given until the result of estimating the P.C. has been obtained. Patients vary considerably in their sensitivity to the drug, and if the dose is not controlled by daily P.C. estimations a serious haemorrhage may occur. Blood for P.C. estimation should not be taken until three hours after the last dose of heparin has been given. The aim of treatment is to keep the P.C. between 10 and 30% of normal (Allen *et al.*, 1947). If the P.C. exceeds 10% a serious haemorrhage is rare, and so long as it is kept below 30% a spread of the thrombosis is unlikely to occur. Dicoumarol is given in the afternoon, the dose depending on the P.C. taken the same day. If the P.C. exceeds 20%, 200 mg. is usually given, although when the P.C. is rapidly falling 100 mg. is sufficient. It must be remembered that a single dose of dicoumarol does not exert its full effect for from 24 to 48 hours. Moreover, in one patient the first two doses may cause an adequate fall of P.C. for a week, while in another a daily dose of 200 mg. may be necessary for several days. The daily dose for most cases is about 100 mg., but it is quite impossible to generalize. The keeping of a simple chart showing the dose of dicoumarol on one-half of the page and the P.C. on the other makes it easier to assess the effect of treatment. The accompanying diagram illustrates the effect of treatment in a patient who developed a deep calf thrombosis after a cardiac infarction. Patients with a high fever or debilitating diseases appear to be more sensitive to the drug and should be treated with greater caution.

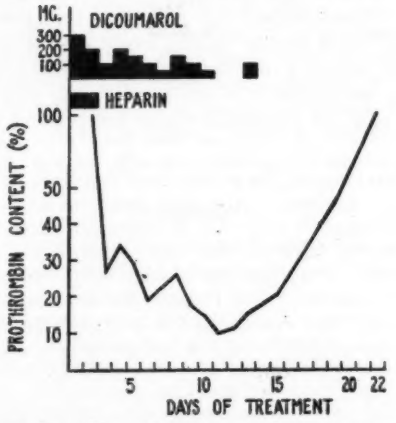

Chart showing the effect of treatment in a case of deep calf thrombosis occurring after a cardiac infarction.

Treatment should be continued until the patient is fully ambulant, a therapeutic depression of the P.C. for 7–10 days usually being adequate. As the anticoagulant effect may last for several days after stopping the drug, care should be taken to see that the P.C. has returned to normal before the patient is discharged. Confidence in the P.C. estimation is essential for dicoumarol therapy. In the earlier cases of the series dosage was controlled by Witts and Hopson's (1940) modification of Fullerton's (1940) method of prothrombin estimation performed on alternate days. Further experience has shown that this method is unsafe, as is explained later.

Leg movements are not restricted, and after the first 48 hours they are actively encouraged. The patient is usually allowed up within three to four days of starting treatment. A Dickson Wright elastic bandage is applied if there is any residual oedema, although women usually prefer an elastic stocking.

Toxic Reaction

Haemorrhage is always a danger during treatment with dicoumarol, although accurate daily estimations of the prothrombin content, together with careful daily examination of the patient for evidence of minor bleeding, will reduce serious haemorrhage to a minimum. Among the 93 patients treated with dicoumarol some form of haemorrhage

*The needle described by Olousson (*Lancet*, 1948, 2, 495) facilitates intermittent injections.

occurred in 26 (28%). In only 8 (8.6%) cases was it considered of moderate or severe degree, and four of these were among the first 10 of the 93 cases treated. The higher incidence of haemorrhage in the earlier cases was almost certainly due to the lack of daily prothrombin estimations and to the use of "stypven" as thromboplastin for the estimations performed. Familiarity with dicoumarol has certainly not bred contempt, but rather an increasing respect for its dangers. In 18 cases slight haemorrhage occurred. In eight of these, however, the only sign was the return of red lochia in the puerperium. This was a frequent event in the treatment of puerperal thrombosis, but was never more than slight in amount and never caused any anxiety.

In the present cases epistaxis (8), vaginal haemorrhage apart from the puerperium (4), ecchymoses (4), haematuria (3), haematoma (2), wound bleeding (2), and oral bleeding (1) all occurred. There was no death from dicoumarol haemorrhage.

Dicoumarol is stopped immediately haemorrhage occurs, and in the mild cases no further action is necessary. If the bleeding is serious, however, one or more pints of fresh blood and an intravenous injection of 100–300 mg. of vitamin K ("synkavit") are given. The latter should be administered slowly, since it may cause giddiness and flushing. Earlier reports stated that vitamin K did not affect dicoumarol haemorrhage, but the doses given were certainly too small. In large doses the P.C. usually rises considerably within two days, but, as with dicoumarol itself, there is a lag in its effect, and fresh blood must be given where an immediate source of prothrombin is required. Haemorrhage may even continue after the P.C. has returned to normal, though this has never been serious.

The incidence of haemorrhage was certainly greater than in some other reported series. Allen *et al.* (1947) had an incidence of 5.2% amongst 1,983 post-operative cases treated prophylactically, and Bruzelius (1945) noted 9.7% of haemorrhages amongst 113 cases. With the present method of P.C. estimation the incidence of severe haemorrhage should be reduced to a minimum.

Heparin rarely produced side-effects. Minor haemorrhages (5), pyrexia probably due to the heparin (4), and pain in the loin following injection (1) all occurred, but only in the last case had treatment to be stopped.

Results

Heparin and dicoumarol were used together in 76 cases, dicoumarol alone in 17, and heparin alone in 7. Heparin was given by continuous intravenous drip in 48 cases, intermittently in 21, and in the remainder by a combination of these methods.

The assessment of results in a small and varied series is difficult and may be misleading. Most cases of leg thrombosis rapidly improved after treatment, the pain and tenderness diminished, and the temperature became normal within four to five days.

In five of the 74 cases of deep thrombosis treated a relapse or spread to the opposite side took place while under treatment, although in two of them there was inadequate depression of the prothrombin content. Relapse of the thrombosis also occurred in four cases after treatment had been stopped. This result compared favourably with that of conservative treatment, in which there is a spread to the opposite leg in 31% of cases (Zilliacus, 1946).

Pulmonary embolism usually responds well to treatment. There were 29 instances of pulmonary embolism in 27 cases: 21 were treated after the attack had taken place, (two of these patients died, both with congestive heart failure following a recent cardiac infarction); in five pulmonary embolism occurred during the treatment, none of them proving fatal; and in three it took place after treatment had been stopped, one of these being fatal. In the last-mentioned case the patient, a woman aged 37, was admitted in severe shock with an extensive thrombophlebitis of the leg associated with superficial haemorrhagic bullae. Dicoumarol was not given, owing to anuria, and she was treated with continuous intravenous heparin. She died from massive pulmonary embolism 43 hours after treatment had been stopped because of increasing haemorrhagic bullae.

Of the 30 treated obstetric cases, 19 were confined in this hospital. These 19 can be compared with 16 cases of puerperal deep thrombosis treated conservatively here during the previous four years. Although the two series are not entirely comparable, the very striking difference in the length of stay in hospital and in the time spent in bed on account of the thrombosis is undoubtedly of significance. The stay in hospital has fallen from 68 to 24 days, and the time in bed from 45 to 6 days. In the group treated conservatively there were four cases of pulmonary embolism (one fatal). In the group treated with anticoagulants there was one non-fatal case of pulmonary embolism.

To summarize, no fatal case of pulmonary embolism occurred among 74 cases of deep leg thrombosis during treatment. And as a result of treatment in cases of puerperal thrombosis the time spent in bed has been reduced from six weeks to one week.

Discussion and Conclusions

Early diagnosis is the key to effective treatment. The irregular post-operative temperature, the "cramp" in the calf, the "stitch in the chest"—all frequent warning signs—are too rarely heeded. A realization of the significance of these signs could prevent many cases of massive pulmonary embolism, and could reprieve the patient with extending calf thrombosis from a future of ulcerated legs.

Many other workers agree with the conclusion derived from the present study, that the anticoagulants provide an effective method of treatment of venous thrombosis. Allen and his associates (1947) treated 352 cases of post-operative venous thrombosis. Venous thrombosis or pulmonary embolism later appeared in only nine cases, although from previous experience at the Mayo Clinic 88 cases would have been expected if conservative treatment had been adopted. No cases of fatal embolism occurred, although 20 would have been expected. Bauer (1946) found that the recumbent period due to leg thrombosis had been reduced from 40 days in 264 cases with conservative treatment to 4.7 days in 209 cases using heparin. Zilliacus (1946) reported similar results.

The sheet-anchor of dicoumarol treatment is an accurate method of estimating the prothrombin content. Unless the physician is fully confident in the results he is obtaining he should use heparin and not dicoumarol. As we consider this a matter of fundamental importance, full details of the method of prothrombin content estimation are given. We have heard of a number of cases of serious or fatal dicoumarol haemorrhage occurring with inadequate control, and as a consequence the drug has been regarded by some as too dangerous to use. We believe that it is the control and not the drug which is at fault.

Venous thrombosis is still frequently treated by immobilization. When the anticoagulants are used they are often given too late, in adequate doses, or without proper supervision. As effective treatment requires some experience, it is suggested that every hospital should have an anticoagulant service under the control of a physician who would be responsible for all cases of venous thrombosis arising. The occasional use of these drugs by each member

of the staff cannot lead to the best results. Although the majority of cases seen will be those occurring while the patient is in hospital under treatment for some other condition, the development of deep venous thrombosis at home should be considered an indication for urgent admission. Anticoagulants can only rarely be given at home, owing to the difficulties of administering heparin and controlling dicoumarol, although intermittent injections of heparin should be used in any emergency until the patient can be transferred to hospital

The ideal anticoagulant would be one that is easy to administer, is inexpensive, and has a widely separated therapeutic and toxic dose. Both the present drugs fall short of this ideal. Suitable slow-acting preparations of heparin for subcutaneous injection may overcome some of the difficulties in future. In the meanwhile we have found the above method to be effective and safe. Present difficulties of administering anticoagulants are no excuse for withholding a valuable and often life-saving treatment.

Summary

An analysis of 100 patients treated with anticoagulants is given. Venous thrombosis is found to be a common condition, especially in medical patients. Heparin combined with dicoumarol is an effective method of treatment. Since dicoumarol needs careful control, a reliable technique for estimating the plasma prothrombin content is described. With early diagnosis of leg thrombosis, both pulmonary embolism and chronic leg ulcers can be prevented.

Our thanks are due to all those members of the hospital staff who allowed us to treat their patients, to the nursing staff whose co-operation has made this study possible, and to Dr. H. Lempert and Dr. G. Discombe for their help and suggestions concerning prothrombin estimation.

APPENDIX

Technique for Estimating Prothrombin Content of Plasma

In the earlier cases of this study the Witts–Fullerton technique for the estimation of prothrombin index was used. In this procedure the thromboplastin is a mixture of Russell-viper venom and lecithin. It was soon found that the prothrombin indices obtained in this way were an insensitive and unreliable control of the clinical state of the patient. A comparison with Quick's (1938) method was therefore made, and, in agreement with Wilson (1947) and Lempert (1948—personal communication), it was found that quantitative values of prothrombin content determined by Quick's method, using human brain as a source of thromboplastin, were a reliable and delicate index of the clinical haemorrhagic tendency of the patient.

Success, however, with Quick's method depends on minute attention to detail, detection of any deterioration of reagent or fault in technique by reference to a control, and previous and expected results on the test plasma. In other words, the approach to this test must be similar to the approach to the routine Wassermann reaction. The literature offers only the outline of the procedure, and so the full details, with an indication of common difficulties, are given here.

Glassware and saline solutions must be prepared as for the Wassermann test.

Reagents

1. *Stock Thromboplastin Powder.*—A coronal slice 2 in. (5 cm.) thick is taken from a human cerebral hemisphere which shows no sign of local disease and has been removed within 24 hours of death, and the blood vessels and pia are removed under a gentle stream of tap-water. With scissors, the slice is cut into cubes of about 1 cm., which are allowed to fall into 450 ml. of acetone contained in a 12-in. (30-cm.) mortar. The fragments are then ground up with a pestle, and after about five minutes the acetone is decanted and replaced by fresh acetone, the grinding being repeated. This procedure is repeated five or six times, when one is left with a mealy mass. The last sample of acetone is decanted; the residue is squeezed between large sheets of blotting-paper, then spread out on a fresh sheet of blotting-paper and placed in a 37°-C. incubator for *not more* than 15 minutes. It is then ground up again for two to three minutes and spread out on large sheets of filter-paper in a vacuum desiccator over anhydrous calcium chloride. The desiccator is attached to a motor-driven vacuum pump (Hyvac or Pulsometer Geryk) and evacuated continuously until a constant minimum pressure is obtained (usually one to two hours). The dry product is ground in the mortar and passed through a nest of metal filters (B.S.S. No. 410, mesh 10, 25, and 44). The product is a cream-coloured sand-like dust which is stored *in vacuo* over calcium chloride at 4° C. It remains active for at least four months.

2. *Working Thromboplastin Solution.*—Weigh out approximately 0.65 g. of stock powder and pour into a universal container, adding 9.5 ml. of saline. Mix thoroughly. Incubate in a 50°-C. incubator or bath for 12 minutes, shaking the container three or four times during this period. Cool immediately in running tap-water. Centrifuge at 1,000–1,500 r.p.m. for two minutes to bring down coarse particles. Pipette off milky supernatant fluid and store at 4° C. The solution thus stored remains active for 48 hours and is prepared on alternate days. A satisfactory reagent is one which gives times for the normal control of 15 to 18 seconds, undiluted plasma being used, and figures of the order of 20, 25, 32, and 59 seconds for the 50, 30, 20, and 10% dilutions in saline of the control plasma. Storage for 24 hours appears to enhance the activity of the solution.

3. *0.2% Calcium Chloride.*—Dissolve 2 g. of pure anhydrous calcium chloride in 1,000 ml. of distilled water. Filter.

4. *M/10 Potassium Oxalate.*—Dissolve 1.84 g. of anhydrous potassium oxalate in 100 ml. of distilled water.

Procedure

A tube containing the calcium chloride reagent is first placed in the 37°-C. bath and allowed to reach this temperature; 0.1 ml. of thromboplastin solution is added to 0.1 ml. of plasma or diluted plasma in a 3 by ½ in. (7.5 by 1.25 cm.) tube, and placed in a 37°-C. water-bath. Then 0.1 ml. of calcium chloride solution at 37° C. is rapidly added, a spring-loaded syringe or pipette with teat being used, thus mixing the compounds. At the moment when the calcium chloride is added a stop-watch is started.

The tube is shaken gently in the water-bath for three to four seconds, then removed and tilted almost horizontally so that the contents run back and forth at eye level. The end-point is the appearance of a fibrin clot, and the time is then taken.

A control plasma is tested daily in parallel with the unknown because reference to a standard curve made up for a batch of dried brain is not satisfactory. It is best to use plasma taken daily from a single volunteer; a new volunteer is obtained each week, usually one of the medical or laboratory staff. The control plasma is tested undiluted and diluted with saline to contain 50, 30, 20, and 10% plasma. A new calibration curve is therefore set up for each day's observations. The patient's plasma is tested undiluted and the prothrombin content read from the curve. All estimations are set up in duplicate and the mean taken.

Special Points

1. *Collection of Plasma.*—Exactly 0.5 ml. of oxalate solution is placed in a bijou bottle and 4.5 ml. of blood obtained by venepuncture is added. The contents are mixed and the bottle is then centrifuged, the supernatant plasma being removed and stored at 4° C., at which temperature it will keep for four to six hours. It is convenient to arrange for blood samples to be collected about 10 a.m. (thus avoiding excessive lipaemia) and to perform all the day's tests together at some convenient time.

2. *Normal controls* and their dilutions do give somewhat varying times with any batch of "thromboplastin solution," but at the critical dilutions—namely, 30, 20, and 10%—this is practically insignificant, as the spread is such that it does permit one to deduce from the plot of a single control the prothrombin content of an unknown sample at these critical levels to within ±5%.

3. *Reading of "End-points."*—This requires practice. Undiluted controls and normal plasmas appear to clot solidly. In the dilutions of the control and test plasmas with lowered prothrombin the end-point takes the form of very fine white flakes or fibres which develop fairly sharply.

4. *Clotting* is accelerated when thromboplastin and plasma are incubated together for more than four minutes before the addition of calcium chloride; it is essential to place no more thromboplastin–plasma mixtures in the water-bath than can be comfortably treated with calcium chloride and read within this time.

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DIABETIC COMA

TREATMENT WITH AND WITHOUT THE EARLY ADMINISTRATION OF GLUCOSE

BY

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Whether or not glucose should be administered in the treatment of diabetic coma has been the subject of much discussion. On the one hand, Himsworth (1932) states that the "essential therapeutic agent in the treatment of diabetic intoxication is glucose, and unless this substance is present in sufficient amounts insulin is relatively impotent." He claims that the "maximum of sugar and the minimum of insulin" should be given, and "not conversely as is the present practice."

On the other hand, Root (1945a) holds that the harmful effects of glucose may be concealed in the early case of coma by the insulin simultaneously administered. He claims that the moderate case may be converted into a severe one requiring excessive insulin dosage, and that "in advanced coma glucose administration either by mouth or by needle may cause anuria and death."

Among those who administer glucose as a beneficial procedure are Bertram (1932), Lawrence (1936), and Soskin (1945). Joslin (1947) and Root (1945a) are the leading opponents of glucose administration, but they do give carbohydrate in quantities not exceeding 10 g. per hour during the second to sixth hour of treatment.

Physiological evidence supporting the administration of glucose is based largely on experimental work such as that of Soskin and Levine (1937, 1944), and of Mirsky *et al.* (1937). The last-named authors have shown that intravenous injection of large amounts of glucose (*a*) to anaesthetized nephrectomized depancreatized dogs, (*b*) to unanaesthetized depancreatized dogs, and (*c*) to phlorhizinized depancreatized dogs, where insulin was entirely excluded, resulted in the disappearance of ketone bodies. The antiketogenic action of glucose is attributed to the deposition of glycogen in the liver and a consequent cessation of ketone formation. Soskin and Levine's (1937) depancreatized hepatectomized animals utilized larger amounts of carbohydrate without insulin when their blood sugars were maintained at high levels. Peters (1945), basing his opinion upon a large field of experimental work, comes to the conclusion that the reversal of the metabolic disorder in diabetic coma requires the use of every measure that will accelerate the utilization of carbohydrate. "Chief among these measures are the administration of insulin and the provision of sugar." Soskin and Levine (1944) calculated a large carbohydrate deficit and advised the administration of 500 g. of carbohydrate during the first twenty-four hours of treatment and one-half that amount during subsequent days in order to maintain normal stores of glycogen and carbohydrate metabolism.

Root (1945b), however, disagrees. He found a deficit of only 27 g. and stressed the point that there has been "an overestimation of the importance of an immediate restoration of glycogen stores in the liver." Franks *et al.* (1947) found that comparable doses of dextrose were retained more efficiently under much smaller doses of insulin when the blood-sugar level was normal than when it was considerably elevated. Mirsky's earlier work, suggesting that maintenance of hyperglycaemia would hasten the abolition of ketosis, is not borne out by Franks's clinical material. Pauls and Drury (1942), working on diabetic rats receiving large quantities of sugar and insulin, provided evidence that only a small part of the sugar was oxidized and that most of it was stored as fat. Drury (1940) showed that glucose may also be converted into fat when it is given at a rate exceeding calorific needs. Astwood's (1942) dogs, receiving glucose continuously at a rate exceeding their metabolic needs, died within 70 hours. Further, Bjering and Iversen (1934) demonstrated that diabetic acidosis exaggerates the limitation of the power of the tubules to reabsorb glucose, and that there is poor retention of exogenous glucose in the presence of hyperglycaemia. Helmholz and Bollman (1940) produced a marked diuresis in response to high concentrations of glucose brought about by injection, and as a result hydropic degeneration of the tubules occurred and temporary anuria developed. Franks *et al.* (1947) showed a "striking difference" between the glucose and saline groups of cases in the handling of water and chloride. The fluid intake of the dextrose group was only slightly larger than that of the saline group, but the output was nearly four times as great, "largely because of an elevenfold difference in glucose output." Sunderman and Dohan (1941) found that hyperglycaemia causes the withdrawal of water from the tissues, and, conversely, that the administration of insulin, with the consequent fall in blood sugar, caused the transfer of water and electrolytes from the plasma to the tissues. In addition, cases of acidosis lost body water and electrolytes after the withdrawal of insulin (Atchley *et al.*, 1933).

The consistent high mortality for cases of diabetic coma in England due to circulatory failure and "intractable dehydration" led us to reconsider the value of the therapeutic measures employed, particularly with regard to the use of glucose and its effect on procedures adopted to correct dehydration.

Material

The West Middlesex is a hospital of 1,670 beds serving a wide area in south-west Middlesex. A large proportion of cases of diabetic coma are admitted as emergencies, never having been under the management of the physician in charge of the diabetic out-patient clinic. Only those cases which are unconscious and not responsive to external stimuli are considered cases of coma. All others, irrespective of the level of the blood sugar, are treated as cases of diabetic ketosis or pre-coma. The mortality in cases of diabetic pre-coma is negligible whether or not glucose is administered in the early stages of treatment.

The 28 consecutive cases of true diabetic coma which were admitted to this medical unit between September, 1944, and March, 1948, have been studied. Those cases admitted before February, 1946 (Group A), were given glucose throughout the first twenty-four hours of treatment, whereas cases admitted after that date (Group B) had no glucose until the blood sugar had reached normal levels or, alternatively, until the patient was able to sit up and drink the glucose without help.

Procedure

On receipt of information from the admissions officer a bed with electric blankets, enema and gastric lavage equipment, "cutting-down set" with pint flasks of normal saline, together with syringes and bottles for chemical investigations, are held in readiness. On arrival the patient is put to bed, surrounded by warm blankets. The diagnosis is confirmed and the severity of the attendant infection assessed. A gastric lavage and a cleansing enema are given while the house-physician cuts down on a vein, removes blood for chemical testing, injects insulin, and proceeds, as the ward sister finishes her work, to set up the intravenous drip.

Insulin.—The mental state of the patient and the severity of the concurrent infection determine the size of the initial dose of insulin, which is never less than 100 units. Where a patient's mental state is graded 4 (Collen) 200 units are usually administered, a quarter of it intravenously. Insulin is given at intervals of not less than two hours thereafter.

Fluids.—The Group A or glucose cases receive intravenous normal saline with 4.3% glucose, and Group B or saline cases receive normal saline intravenously until there is adequate correction of the hypochloruria, after which half-normal saline is given. Every case receives not less than 2 pints (1.14 litres) of fluid intravenously in the first hour. In the older diabetic, or in cases in which cardiac embarrassment is expected, an intragastric drip is set up after the fourth to sixth hour, even though altered blood may have been present in the stomach contents during lavage.

Glucose.—The saline cases do not receive glucose in the first four-hour period, and in the second four-hour period it is given only if the patient becomes fully conscious. In the third four-hour period glucose is always administered, usually by mouth. Not more than 100 g. is given over the first 24-hour period in any one case in the saline series. The glucose cases receive a standard solution of 4.3% glucose in normal saline, whether by vein, mouth, or intragastric drip.

Potassium.—Since the publication of Holler's (1946) case and the subsequent cases by Nicholson and Branning (1947) and by Martin and Wertman (1947), about 1 dr. (4 g.) of potassium chloride is left in the stomach after lavage in the most severe cases.

Results

A comparison of therapeutic results between different series of cases of diabetic coma is not always easy. The definition of coma varies widely and there is no entirely satisfactory method of assessing the severity of individual cases. Timing the duration of coma is not always a simple matter, and it is difficult to obtain a history of exactly when, in the insidious course of diabetic ketosis, a patient lapsed from one mental state to another. Further, there is no definite evidence that the duration of coma up to about eight hours, taken by itself, correlates closely with the ultimate outcome. Collen's indices have been used, as they appear to be the most accurate available guide to prognosis (Collen, 1942). He computed his severity index by means of the following formula

$$\frac{30(\text{M.S.} + \text{C}) + 50 + \text{A} - \text{diastolic B.P.}}{4}$$

where M.S. is the mental state and C the complications.

M.S. is graded thus: 0 = conscious, 1 = drowsy, 2 = semi-conscious, 3 = unconscious but with response to pain, 4 = unconscious with no response to pain.

C is "complications," graded numerically from 0 to 5 in terms of danger to life. Grade 1 is "infection or other complication present" but of no real consequence. Grade 5 is "infection or other complication present" which by itself would seriously endanger life. Examples: Grade 1 — carbuncles (Case B1), pyelitis (Case B6); Grade 3 — lobar pneumonia (Case B14); Grade 5 — bilateral empyemata (Case B8).

A = Age in years.

Indices of over 60% are considered invariably fatal and those of below 30% bear a good prognosis. As Franks remarks, it would appear that only those cases in the "intermediate group are suitable for the evaluation of a therapeutic regimen."

TABLE I.—*Group A Cases*

Case No.	Age and Sex	Duration of Coma (hours)	M.S.	C.	B.P.	Collen's Index %	Blood Sugar (mg. per 100 ml.)						Alkali Reserve (Vols. CO_2%)				Insulin Units (Total Dose)					Fluids (pints)		Deaths
							Adm.	4 hrs.	8 hrs.	12 hrs.	16 hrs.	20 hrs.	Adm. hrs.	4 hrs.	8 hrs.	12 hrs.	Adm.	4 hrs.	8 hrs.	12 hrs.	24 hrs.	Intravenous 24 hrs.	Total 24 hrs.	
1	55 F	4	4	2	100/55	57	880	760					8	12			200	400	600			6		Died
2	61 M	4	3	2	145/90	43	768	610	463				17				200	400	600	800		8		Died
3	26 M	3	3		110/70	24	660	580	480	312	180	214	12	18	31		200	400	560	680	800	9	14	
4	31 F	2	3	1	90/60	35	510	500	495	216	204	214	15	16	18	26	200	360	440	480	600	12	15	
5	56 F	4	4	2	130/75	53	804	830					9	8	13		200	400	760			8		Died
6	18 F	6	3	—	100/65	23	822	750	598	580	312	226	18	21	28	33	100	300	500	680	800	11	17	
7	32 M	6	4	2	50/30	58	985	810	805	620			5	8			200	380	580	700		11		Died
8	37 F	½	4	—	70/50	38	708	648	630	524	475		14	19			200	400	600	800	1,060	8	15	
9	29 F	4	3	1	100/75	31	540	438	256	180	84		13	15	21	26	100	300	460	580	740	8	13	
10	14 F	2	4	1	95/65	37	618	616	543	205	198	216	17	30	35		200	460	600	740	840	9	12	

Group A or Glucose Cases

Group A comprises ten cases ranging from 14 to 61 years, with an average of 35.9 years. Seven cases were in females. The figures given for the duration of coma are approximations. On admission all the cases described were unconscious and did not respond to external stimuli. Five cases responded feebly to a strong painful stimulus applied to the sole of the foot. Complications were few in this group and were mild in nature. The diastolic blood pressure ranged from 30 to 90 mm. Hg. Collen's formula was worked out and indices of between 23 and 58% (average 39.9%, mean deviation 10.2) were found. The four patients (Cases 1, 2, 5, 7) who died had indices of 57, 43, 53, and 58% respectively.

The initial blood sugar for the ten cases averaged 729.5 mg. per 100 ml., the lowest being 510 mg. and the highest 985 mg. The fall during the first four hours was calculated for each case: the readings for Case 5 rose, but the mean fall was 75.3 mg. per 100 ml.

Fluid intake for the survivors over the first 24 hours was 14.3 pints (8.13 litres), of which 9.5 pints (5.39 litres) were given intravenously and the remainder by other routes, such as by intragastric drip, by rectum, and by mouth. Glucose was administered in this group at the rate of 46 g. in the first hour,

23 g. in the second, and between 20 and 30 g. in the succeeding two hours. The average total glucose intake was 330 g. in 24 hours. The volume of the urinary output was measured in five cases. The output was 43.3% of the fluid intake.

The initial dose of insulin was either 100 or 200 units, with similar amounts given at two-hourly intervals until the readings showed definite signs of a fall. An average of 807 units was given to each surviving case in 24 hours. The urine became acetone-free in this group of cases in 13 hours (range 10 to 24).

TABLE II.—*Group B Cases*

Case No.	Age and Sex	Duration of Coma (hours)	M.S.	C.	B.P.	Collen's Index %	Blood Sugar (mg. per 100 ml.)						Alkali Reserve (Vols. CO_2%)				Insulin Units (Total Dose)					Fluids (pints)		Deaths
							Adm.	4 hrs.	8 hrs.	12 hrs.	16 hrs.	20 hrs.	Adm. hrs.	4 hrs.	8 hrs.	12 hrs.	Adm.	4 hrs.	8 hrs.	12 hrs.	24 hrs.	Intravenous 24 hrs.	Total 24 hrs.	
1	16 M	3	3	1	100/60	32	984	540	350	212	180		16	38			200	360	420	480	580	6	9	
2	42 F	2	3	2	105/65	44	780	420	318	232			18	18	30	50	200	360	480	600	700	5	8½	
3	48 F	5	4	1	100/50	50	1,050	788	280				11	26			200	380	460	520	640	6	9	
4	55 F	5	3	1	110/55	43	835	418	242				15	30			100	300	420	500	620	5	11	
5	42 M	1	3	1	100/70	35	900	816	340				12	14			200	380	460	520	640	2*	7	
6	40 F	3	3	1	125/70	35	597	194	120				14	40			200	360	420	480	580	4	9	
7	45 M	4	3	—	130/80	26	980	630	318				14	26			100	300	500	660	860	8	11	
8	22 M	6	4	5	40/0	86	954	?	648				9	11			300	600	760	920	1,100	8		Died
9	25 F	5	4	—	95/55	35	1,150	678	328				10	25			100	300	500	640	740	5	9½	
10	33 F	3	3	1	125/75	32	786	486	320				16	32			100	300	460	540	680	6	10	
11	19 M	½	3	2	125/80	35	1,074	728	—	246			15	—	39		200	400	600	850	1,050	8	11	
12	17 F	3	3	1	110/75	28	832	528	—	308			22	42			100	300	460	620	780	5	10	
13	11 F	5	4	1	95/65	37	542	282	102	265			15	32	45		100	300	360	400	480	4	9	
14	27 F	2	3	3	120/80	44	764	324					18				100	300	480	540	680	5	12	
15	42 F	2	4	3	115/60	60	924	502	280				10	10			200	400	560	·		7		Died
16	13 F	Coma on adm.	4	—	90/50	33	630	380					?	30			80	240	360	460	560	5	9	
17	44 M	2	3	3	110/80	49	920	540	324				17	48			200	380	460	520	640	7	14	
18	58 F	4	3	2	135/80	45	860	500					9	21			200	400	560	720	860	4	11	

*Case 5 received only two pints of fluid intravenously, the third and fourth pints having inadvertently dripped into the bedclothes. Nevertheless, the patient rehydrated adequately.

Group B or Saline Cases

This group comprises eighteen cases ranging from 11 to 58 years, with an average of 33.3 years. Twelve cases were in females. Six cases fell into the most serious grading of mental state, whereas the remaining twelve responded to strong painful stimuli applied to the sole of the foot. The diastolic blood pressure fell in some cases to dangerous levels. The lowest recording of 40/0 mm. Hg was for Case 8, who was nearly moribund. The highest readings, 135/80 mm. Hg, were in Case 18, whose pressures rose in convalescence to 185/110. There were all degrees of complications, eight being Grade 1, three Grade 2, three Grade 3, and one Grade 5. Case 15 had lobar pneumonia and Case 8 suffered from bilateral empyemata. These two patients (severity indices 60 and 86% respectively) died. Collen's indices for the whole group ranged from 26 to 86%, with an average of 41.6% (mean deviation 9.8).

The mean initial blood sugar was 865 mg. per 100 ml., the lowest being 542 mg. and the highest 1,150 mg. The calculated fall in the first four hours was 339 mg. The total 24-hour fluid intake for the sixteen surviving patients was almost exactly 10 pints (5.68 litres), of which 5 pints (2.84 litres) were given intravenously. The total urinary output in those cases (eight in number) where the urine was successfully collected and measured amounted to 21% of the total 24-hour intake. The initial dose of insulin was either 100 or 200 units. Three hundred units were given in one case (100 intravenously), but the fourth-hour sugar reading was unfortunately lost. The average total dose of insulin given over 24 hours was 693 units. Acetone disappeared from the urine in 14 hours (range 11 to 24+).

The two groups of cases considered are of nearly equal severity and the age distribution is very similar. In other respects, such as depth and duration of coma, incidence of complications, level of diastolic pressure, and height of initial blood sugar, the groups of cases are comparable.

The procedure adopted in treatment throughout the first twenty-four hours was identical in the two groups except for the fact that Group B cases did not have glucose in the early stages of treatment.

The most significant result is that the mortality in Group A was 40% and in Group B 11%. Further, the fall in blood sugar in the first eight hours was more pronounced in the saline group and the output of urine (eight cases) was 21% of the total intake for the twenty-four hours, whereas in the glucose cases urinary output (five cases) amounted to 43% of the intake. Nearly 50% more fluid was required to produce an adequate clinical state of hydration in those surviving cases given glucose.

Comment

There is a big difference in the mortality of two groups of comparable cases treated with and without glucose by what was otherwise the same therapeutic technique. Arguments in favour of the point of view that glucose is utilized at high blood-sugar levels, up to 2,000 mg. per 100 ml. (Wierzuchowski and Bielinski, 1939), and that its administration in cases of coma restores carbohydrate metabolism, abolishes acidosis, and replenishes the liver glycogen would seem to be physiologically incontrovertible. Peters (1945) has made out a very good case for glucose administration on these grounds. Much of the literature and the mortality statistics relating to this controversy are from America, where cases described as those of coma include cases of what would be labelled pre-coma or ketosis in Britain. It would seem, therefore, that American authors dealing with large numbers of cases of ketosis and coma find that only a small proportion present as emergencies of dehydration.

It is possible that because of this there has been, as Root suggests, "an overemphasis of the importance of an immediate restoration of glycogen stores in the liver." The controversy is still being fought on physiological issues. The main point disputed is whether or not a patient in diabetic coma can utilize glucose at a high blood-sugar level.

Still undetermined are such subsidiary points as whether the endogenous glucose is sufficient for purposes of carbohydrate metabolism when insulin is supplied, what quantities of glucose are retained at what level of blood sugar and under what doses of insulin, and whether or not the early administration of glucose abolishes ketosis more quickly. None of these points is by any means decided for the diabetic human being, although experimental animals with induced glycosuria give more or less conclusive results in favour of glucose utilization and glycogen restoration at high blood-sugar levels.

It is possible that the higher mortality for cases which were given glucose is not connected with the action of glucose on carbohydrate metabolism, which is probably beneficial, but on its interference with the process of cellular rehydration. The maintenance of hyperglycaemia induces an intense and prolonged glycosuria and, associated with it, a proportional diuresis. The urinary output bears a linear ratio to the glucose output (Franks *et al.*, 1947). The urinary output in our Group A cases was 43.3% of the total intake, and the fluid intake in these cases was 43% more than in the cases not given glucose.

The administration of glucose in the first four hours of treatment, by maintaining a heightened blood sugar, serves to increase water excretion, to worsen the state of cellular dehydration, and to add to the circulatory collapse and shock. This process may be of no great consequence in the milder cases, but where the clinical state of the patient is poor it may cause death.

The results of this study indicate that glucose should not be administered in the early stages of the treatment of diabetic coma. The withholding of glucose for at least the first four to six hours of treatment ensures rapid rehydration and decreases the mortality significantly in serious cases of coma with circulatory collapse.

Summary

A clinical study of 28 consecutive cases of diabetic coma treated with and without the early administration of glucose is described.

Ten cases received glucose and 18 only saline in the first four to six hours of treatment. The two groups of cases were comparable.

There was a mortality of 40% in the glucose cases and of 11% in the saline cases.

The results of this study indicate that the administration of glucose to serious cases of diabetic coma in the early stages of treatment interferes with rapid rehydration and increases the mortality significantly.

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SUBACUTE PANCREATITIS

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The most commonly recognized types of pancreatitis are the acute haemorrhagic form, with its dramatic clinical picture and high mortality rate, and the chronic type, with a long-drawn-out history of dyspepsia associated with general ill-health. Of the other degrees of pancreatitis, there is the variety which gives rise to a prolonged illness, with abscess formation, and the low-grade pancreatitis which may later progress to pseudocyst formation.

All these types are well known, but there remains another degree of the condition—subacute pancreatitis—which is not so widely recognized. Subacute pancreatitis is a fairly rapidly developing inflammation of the pancreas, generally associated with much oedema, which, though presenting as a surgical emergency, does not produce the same urgent clinical picture as is presented by the haemorrhagic form. There is a marked tendency to recurrence, and the initial attack is generally followed by several similar attacks over a period of time, producing the syndrome of recurrent pancreatitis. During one year at the General Hospital, Birmingham, there were 19 cases of subacute pancreatitis, of which 13 were recurrent attacks.

Pathology : Clinical Picture

At operation the gland is found to be enlarged and oedematous. The enlargement is sometimes very gross, and in three cases abdominal palpation revealed a mass which was found at operation to be an enlarged pancreas. In one instance the oedematous pancreas produced pyloric obstruction. The surface of the gland may present petechial haemorrhages and the peripancreatic lymph nodes are enlarged. There may be some free fluid in the peritoneum, but it is not blood-stained as in haemorrhagic pancreatitis. In two cases there was fat necrosis in the omentum.

The clinical findings are shown in Tables I and II. The patient, usually middle-aged and obese, develops upper abdominal pain which, though not severe at first, gradually increases in intensity over several hours until it is unbearable. The pain may be situated in the epigastrium or in the right or left hypochondrium. In some cases it is felt right across the abdomen under the subcostal margin. The pain, which may continue unabated for several hours, does not vary in intensity. When asked to describe the pain the patient generally states that it is deep-seated and boring in nature and that it passes through to the back. Vomiting occurs early, and when the stomach contents have been emptied incessant retching adds to the patient's distress. The temperature is normal, but the pulse rate is generally raised. There is some tenderness and guarding in the upper abdomen, and this may be present anywhere in the subcostal region. There is tenderness in one or both loins and in the costovertebral angles posteriorly. There are some inconstant signs, such as jaundice, due to obstruction of the common bile duct by the swollen pancreas, and occasionally glycosuria. In cases presenting recurrent attacks the clinical picture is similar, but vomiting is not severe, and the tenderness, when present, is only slight.

Laboratory Investigations

Only two of the multitude of investigations described for pancreatitis have proved of use in establishing the diagnosis—estimation of the level of the serum lipase and serum

TABLE I.—*Summary of Clinical Findings in Patients Suffering from an Initial Attack of Subacute Pancreatitis*

Case	Onset	Pain		Vomiting	Tenderness	Guarding	Jaundice	Glycosuria	Serum Amylase	Treatment
		Situation	Type							
1	Gradual; 24 hours	Epigastrium and through to back	Constant and deep-seated	Severe	Generalized: especially marked in epigastrium	Epigastrium	Nil	++	Urinary diastatic index 100 units	Conservative
2	Gradual; 48 hours	Epigastrium, right hypochondrium and through to back	,,	,,	Right and left hypochondria, costovertebral angles posteriorly	Right and left hypochondria	Slight	Nil	438 units; two months later 61 units	,,
3	Gradual; 5 days	Epigastrium, right and left hypochondria	,,	Very severe	Left hypochondrium and left costovertebral angle	Nil	,,	,,	32 units	Laparotomy
4	Gradual; 4 days	Epigastrium and right hypochondrium	,,	,,	Right hypochondrium and right costovertebral angle	Right hypochondrium	Nil	,,	51 ,,	,,
5	Gradual; 4 days	Epigastrium and left hypochondrium	,,	Severe	Right hypochondrium, right and left costovertebral angles	Nil	Severe	,,	190 ,,	,,
6	Gradual; 8 hours	Left hypochondrium	,,	Vomiting at onset severe, retching afterwards	Left hypochondrium and epigastrium	Nil	Slight	,,	439 units; one month later 46 units	Conservative

TABLE II.—*Summary of Clinical Findings in Patients Suffering from a Recurrent Attack of Subacute Pancreatitis*

Case	Duration of Attacks	Pain		Vomiting	Jaundice	Glycosuria	Serum Amylase	Findings at Laparotomy
		Situation	Type					
7	5 years	Right hypochondrium and epigastrium	Constant and deep-seated	Severe	Slight	++++	36 units	Enlarged hard pancreas. Areas of fat necrosis in omentum
8	3 ,,	Epigastrium	,, ,,	,,	Nil	Nil	164 ,,	Enlarged firm pancreas. Areas of fat necrosis in omentum
9	3 ,,	Subcostal; through to to back	,, ,,	Occasionally	,,	,,	59 ,,	Enlarged hard pancreas
10	3 ,,	Subcostal	,, ,,	Severe	,,	,,	245 units (during attack); 39 units three weeks later	Enlarged pancreas
11	6 ,,	,,	,, ,,	Never	,,	,,	258 units during exacerbation	,, ,,
12	"Years"	Epigastrium	1½ hrs. after meals, constant for 2 hrs.	,,	,,	,,	Not tested	Enlarged pancreas. Irregular "bosses"
13	2 years	Left hypochondrium	1 hr. after meals, constant for 2 hrs.	Severe	,,	,,	,,	Enlarged pancreas. Areas of fat necrosis in omentum
14	18 ,,	Left hypochondrium and epigastrium	Constant and deep-seated	,,	,,	,,	42 units	No laparotomy
15	15 ,,	,, ,,	,, ,,	Occasionally	Severe	+++	Diastatic index urine, 6	Patient died. Enlarged fibrosed pancreas
16	10 ,,	,, ,,	,, ,,	,,	Nil	Nil	Not tested	No laparotomy
17	2 ,,	Right hypochondrium and right costo-vertebral angle	,, ,,	Severe	,,	,,	59 units	Enlarged pancreas
18	2 ,,	Epigastrium	"Dragging"	Occasionally	,,	,,	504 units in exacerbation	,, ,,
19	3 ,,	Subcostal	Constant and deep-seated	,,	,,	,,	217 units in exacerbation	No laparotomy

amylase. Several estimations of the serum amylase have been made both in normal subjects and in patients suffering from various abdominal lesions. Somogyi (1932) stated that the normal limits were 80 to 180 units. Lewison (1941) gave 40 to 175 units as the normal range, and our results are more in keeping with those of Lewison than with those of Somogyi.

In the initial attacks the serum amylase is raised above normal and remains elevated until the symptoms have abated. In recurrent attacks the serum amylase is generally below normal, presumably because repeated attacks are associated with fibrosis of the gland and diminution of acinar tissue. Occasionally during an exacerbation the blood amylase is raised above normal and then settles to a subnormal limit later. This was found in three of the cases in this series.

The diastatic index of the urine follows the changes in the serum amylase level and is dependent upon the renal threshold for amylase being exceeded.

Diagnosis

The main features of subacute pancreatitis are: the deep-seated severe pain, which is of gradual onset and long duration, is situated anywhere in the subcostal region, and passes through to the back; the constant nature of the pain; the incessant vomiting and retching; the tenderness in one or both costovertebral angles; and, finally, the elevation of the serum amylase.

Differentiation from Perforated Gastric Ulcer

The clinical picture is as clear-cut as that produced by an acute appendicitis. An acute exacerbation of symptoms in a patient suffering from a chronic peptic ulcer may give rise to confusion, but the history and a normal serum-amylase level should make the diagnosis obvious. The dramatic picture presented by a perforated gastric ulcer differentiates it readily from subacute pancreatitis, though occasionally confusion may occur, as in the following case.

A man was admitted to the General Hospital on July 2, 1946, complaining of severe epigastric pain. He gave a history of attacks of pain in the left hypochondrium over the previous twelve years. The pain was of a constant nature and would continue unabated for 48 hours, uninfluenced by food and unrelieved by alkalis. Forty-eight hours before admission he had what he described as "a characteristic attack." The pain was continuous and constant for 24 hours and then subsided. Twelve hours later the pain recurred and gradually intensified to agonizing severity. He vomited twice at the onset of the pain, after which retching was incessant. On examination he was slightly jaundiced; there was epigastric distension, with generalized abdominal tenderness and guarding, but no rigidity. No tenderness was felt in the costovertebral angle. The serum amylase was 54 units, the blood sugar 270 mg. per 100 ml., and there was heavy glycosuria. A diagnosis of recurrent pancreatitis was made, but the patient was subsequently proved to be suffering from a perforated duodenal ulcer.

This case is unusual, however, and the differentiation of the two conditions should not prove difficult. Confusion has arisen with coronary occlusion, cholangitis, and

intestinal obstruction: however, in each case the history and signs differ in many points from those presented by subacute pancreatitis, and the serum-amylase level is within normal limits.

Confusion with Acute Cholecystitis

The condition most likely to give rise to confusion is acute cholecystitis, especially when subacute pancreatitis is associated with pain and tenderness in the right hypochondrium. The differential points to be borne in mind are the incessant retching which accompanies subacute pancreatitis, the tenderness in the costovertebral angles, and the rise in the serum-amylase level. Acute cholecystitis is often associated with a rise in temperature; this is not seen in subacute pancreatitis.

Undoubtedly many cases of subacute pancreatitis are incorrectly diagnosed as acute cholecystitis. Many of these cases are later subjected to an interval operation, and at laparotomy nothing abnormal is found. In such instances cholecystectomy may be performed with minimal pathological justification. On the other hand, evidence of a chronic cholecystitis may be found, and it has been stated that chronic cholecystitis is an aetiological factor in subacute pancreatitis. In such instances it is probably advisable to remove the gall-bladder, but it must be borne in mind that if the original condition was subacute pancreatitis and not acute cholecystitis, then the symptoms are apt to reappear.

Recurrence of symptoms after cholecystectomy is a condition so well known that a name has been given to it—the post-cholecystectomy syndrome. This syndrome may be produced by a stone in the common bile duct or by attacks of pancreatitis. This latter condition, though not generally recognized, is much more frequent than is commonly acknowledged. The following is a typical case.

This patient, aged 67, was admitted to the General Hospital suffering from jaundice. A cholecystectomy was performed in 1930, and since that date the patient had had attacks of pain situated in the epigastrium and left hypochondrium which would continue unabated from two to eight hours. Vomiting and retching and occasionally jaundice were associated with the attacks. During the month before admission the patient had had several such attacks and had become progressively more jaundiced. There was marked glycosuria and the diastatic index of the urine was 6 Wohlgemuth units. Death occurred shortly after admission, and necropsy revealed an enlarged fibrosed pancreas with dilated ducts.

Confusion with Gall-stone Colic

When subacute pancreatitis is associated with jaundice the condition may be confused with gall-stone colic. A careful consideration of the history and physical findings taken in conjunction with the level of the serum amylase should differentiate the two conditions. In this respect the following case of subacute pancreatitis is of interest.

Case 5 (*see Table I*).—This patient, a young woman, was admitted to the General Hospital on Sept. 19, 1945, with a history of attacks of epigastric pain over the previous ten days, increasing in severity. The pain was constant in nature and was associated with severe vomiting. Four days before admission the patient became jaundiced. On examination she was deeply jaundiced; the abdomen was flaccid, with guarding and tenderness in the right hypochondrium and tenderness in the costovertebral angles posteriorly. A radiograph revealed a shadow in the gall-bladder area which was reported as being possibly due to a gall-stone. The serum amylase was 190 units. A pre-operative diagnosis of cholecystitis was made, but laparotomy revealed a normal gall-bladder with no evidence of calculi. The pancreas was swollen, congested, and oedematous, and the peripancreatic lymph glands were enlarged. The patient made an uneventful recovery. Four weeks later the blood amylase was 80 units.

Treatment

The treatment of subacute pancreatitis is conservative. Rest in bed should be enforced until symptoms have subsided. Large doses of morphine may be necessary in the first few hours to give the patient relief from pain, but apart from this no other special medical treatment is indicated. When there is a history of recurrent attacks of subacute pancreatitis the gall-bladder should be investigated, and if there is any evidence of chronic cholecystitis cholecystectomy should be performed, as it is very probable that the diseased gall-bladder is acting as the focus of infection for the recurrent attacks of pancreatic inflammation.

Typical Case Reports

The following two cases are reported in full as being typical of the conditions described.

Subacute Pancreatitis (Case 6)

A middle-aged man was admitted to the General Hospital on Dec. 28, 1945, complaining of severe pain in the left loin and left hypochondrium. The pain was described as being deep-seated and passing through to the back. It later radiated to the right hypochondrium. The patient vomited at the onset of the attack and had suffered from severe retching throughout.

On examination he was jaundiced and was tender on deep palpation in the left hypochondrium, the epigastrium, the left loin, and the left costovertebral angle. The serum amylase was 439 units and the serum bilirubin 6 mg. per 100 ml. He settled down on conservative treatment, and a month later his blood amylase had fallen to 46 units.

Recurrent Pancreatitis (Case 7)

A man was admitted to the General Hospital on Nov. 20, 1941, complaining of intermittent attacks of epigastric pain over the previous eight weeks. The pain was continuous and was unrelated to food. The attack immediately before admission had continued for four days, during which time he had vomited incessantly. A diagnosis of subacute intestinal obstruction was made. A laparotomy was undertaken, but failed to reveal any abnormality. The patient made an uneventful post-operative recovery.

On Nov. 21, 1942, he was readmitted complaining of an exactly similar attack of only two hours' duration. A diagnosis of perforated gastric ulcer was made, but laparotomy revealed no abnormality in the stomach. The pancreas was swollen greatly and was very hard. He again made an uneventful post-operative recovery.

On May 5, 1944, a similar attack occurred and the patient was readmitted to hospital. A diagnosis of subacute obstruction due to severe constipation was made. It was noticed that he was suffering from severe diabetes.

On April 12, 1946, he was readmitted after an exactly similar attack. On examination he was tender in the epigastrium, in the left hypochondrium, and in both costovertebral angles. The blood sugar was 235 mg. per 100 ml. and the blood amylase was 36 units. The patient progressed well on conservative treatment and was discharged in ten days.

I am convinced that Case 7 was a clear-cut instance of recurrent pancreatitis. The low level of the serum amylase is in keeping with the fibrosis which must have occurred in the pancreas.

Conclusion

Subacute pancreatitis has a clinical picture as clear-cut as that presented by a perforated gastric ulcer. The diagnosis, though it may readily be made by consideration of the history and physical signs, is confirmed by the changes in the serum-amylase level.

The possibility of subacute pancreatitis must always be borne in mind when diagnosing an abdominal emergency, especially acute cholecystitis. Confusion of the condition with cholecystitis accounts for many of the cases of recurrence of symptoms following cholecystectomy. This error

in diagnosis would largely be obviated if serum-amylase investigations were more often employed in elucidating obscure cases of upper abdominal pain.

Subacute pancreatitis is not a rare condition, and its diagnosis depends largely on being aware of the existence of this clinical syndrome.

Summary

Subacute pancreatitis is a clinical entity readily differentiated from acute haemorrhagic pancreatitis and other abdominal emergencies.

Patients suffering from this condition present as an acute abdominal emergency but settle down on conservative treatment.

The condition is very apt to recur. Of the 19 cases presented 13 were recurrent attacks.

It is suggested that estimation of the serum-amylase level should be more widely employed to differentiate this condition from other acute abdominal lesions.

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REPORT ON AN OUTBREAK OF INFLUENZA IN THE ARMY

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During the months of January and February, 1949, several Army units in Mid-West District, which comprises the whole of Wales and the adjoining English counties, reported that cases of influenza were occurring among their personnel. The first cases to be diagnosed as influenza occurred on Jan. 19 in units stationed at Malvern. The second unit affected was a Boys' Battery of the Royal Artillery, near Rhyl, on Jan. 24. On Jan. 31 cases were reported at Lichfield and on the following day at Donnington. Oswestry garrison were the next victims, on Feb. 7, and by Feb. 21 cases were also being reported from Nesscliffe, near Shrewsbury, Wrexham, and Tonfanau, on the Welsh coast. A total of 646 cases were notified from all Army units in Mid-West District from the start of the outbreak on Jan. 19 to Feb. 21.

Features of the Outbreak

It had been previously impressed upon all ranks that if an epidemic of influenza did occur it was of prime importance to report sick early. Nearly all soldiers affected attended their medical officer within a few hours of experiencing their first symptoms. It is interesting to note that, in one instance only, a soldier remained in his barrack room for over 24 hours before reporting sick. Eighteen out of twenty of his comrades in the same hut developed influenza later.

The main features were a sudden onset with frontal headaches, a transient sore throat without lymph-node enlargement or tenderness, a slight cough, and a feeling of general weakness and lassitude, coupled with aches and pains in the arms and legs and in the lumbar region. Mild rigors preceded the rise in temperature, which was in the neighbourhood of 103° F. (39.4° C.), although a few cases did develop temperatures of 105° F. (40.6° C.). Circumoral pallor, injection of the conjunctivae, and profuse nasal discharge were absent. Epistaxis occurred in a few cases at Lichfield, but was not a common feature. The temperature gradually dropped, and by the fourth day of the disease most patients were apyrexial. Chest complications did not occur and after-effects were absent amongst the great majority of male patients. In the few cases occurring in the W.R.A.C. or A.T.S., however, lassitude and post-influenzal depression were noted.

Patients were treated in camp reception stations until their temperature subsided, and were then transferred to barrack accommodation for a convalescent period of two days before starting duty. The average duration of the illness from the initial symptoms until return to full duty was between six and eight days.

Treatment.—This was of a palliative nature. Warmth, rest in bed, and plenty of fluids by mouth were the main principles adopted. Salicylates and Dover's powder were given during the pyrexial period, and codeine if the cough proved troublesome.

Laboratory Investigations

When it was obvious that a definite outbreak had occurred each garrison was visited and throat washings in 10–15 ml. of sterile saline were taken from selected cases. Febrile patients or cases in the early stages of the illness were chosen so far as was possible. The washings were packed in ice and delivered within six hours to the Central Public Health Laboratory, Colindale, and the National Institute for Medical Research, Hampstead, where they were examined for the presence of virus. Broth was not added to the washings: the addition of 5 ml. would have improved the chances of recovering the virus.

The first of the paired sera required for the Hirst and complement fixation tests was taken at this visit. This was held in the refrigerator at 2–3° C. until the second of the pair was taken, on the twelfth to fourteenth day of the disease.

The sera were examined by Dr. A. P. Goffe at the Central Public Health Laboratory, Colindale; the results are indicated in brief in the tabulated schemes which follow.

TABLE I.—*Cases at Rhyl (all males)*

Case No.	Symptoms: Age in Years	Shivering	Headache	Sore Throat	Cough	Muscle Pains	Temperature on Day of Disease
1	16½	++	+	+	+	+	100·8° F.; 1st (38·2° C.)
2	15½	++	+	+	+	−	101·6° F.; 1st (38·7° C.)
3	20	++	++	+	+	±	97·0° F.; 3rd (36·1° C.)
4	17½	++	+	−	+	+	98·0° F.; 4th (36·7° C.)
5	16½	−	++	+	+	±	97·8° F.; 3rd (36·55° C.)
6	16	+	++	++	+	−	98·0° F.; 4th (36·7° C.)

Saline Washings.—Report on Feb. 2, 1949: Type A virus isolated in two cases from washings taken on Jan. 28, 1949.

Hirst Test.—Four cases showed fourfold rise of antibody inhibiting fowl red-cell agglutinin (A PR 8) in second serum. Two cases in which the first serum (taken on the fourth day of illness) showed a high titre (1 in 48) had a twofold rise on the 14th day in antibody to A PR 8 agglutinin.

C.F.T.—Second sera showed 16- to 64-fold rise in complement-fixing antibody to Type A strain antigen.

Result.—Influenza type A.

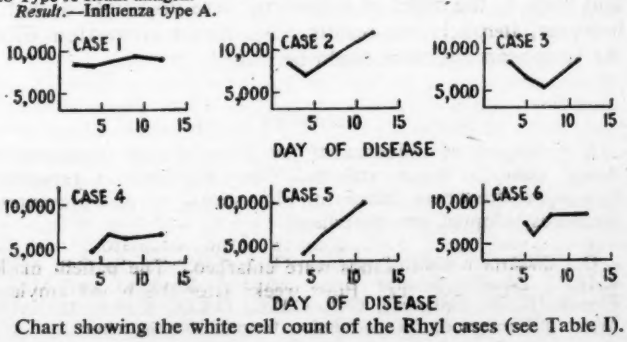

Chart showing the white cell count of the Rhyl cases (see Table I).

TABLE II.—*Cases at Lichfield (all males)*

Case No.	Symptoms						
	Age	Shivering	Head-ache	Sore Throat	Cough	Muscle Pains	Temperature on Day of Disease
1	18		−	Dry	+		101·6° F.; 2nd (38·7° C.)
2	18	−	+	Dry	+	+	101·0° F.; 2nd (38·3° C.)
3	19	+		Dry	+		98·4° F.; 2nd (36·9° C.)
4	22	+	+	+		+	102·8° F.; 1st (39·3° C.)

Saline Washings.—Virus was not isolated from these washings.
C.F.T.—Second sera showed 4- or 8-fold rise in titre of complement-fixing antibody to Type A strain antigen.
Result.—Influenza type A.

TABLE III.—*Cases at Donnington (all males)*

Case No.	Symptoms						
	Age	Shivering	Head-ache	Sore Throat	Cough	Muscle Pains	Temperature on Day of Disease
1	19	+	+	−	−	+	99·6° F.; 3rd (37·55° C.)
2	18	+	+	−	−	+	99·8° F.; 3rd (37·7° C.)
3	18	+	+	−	−	+	98·0° F.; 3rd (36·7° C.)
4	19	+	+	−	−	+	100·0° F.; 2nd (37·8° C.)
5	20	−	+	−	+	+	100·2° F.; 3rd (37·9° C.)
6	19	+	+	−	+	−	100·8° F.; 3rd (38·2° C.)
7	20	+	−	+	+	−	100·2° F.; 5th (37·9° C.)
8	18	+	+	−	+	−	99·4° F.; 3rd (37·4° C.)

Saline Washings.—Type A strain of virus isolated in one case from washings taken on Feb. 9, 1949.
C.F.T.—Second sera showed 8- to 32-fold rise in titre of complement-fixing antibody to Type A strain antigen.
Result.—Influenza type A.

Complement fixation tests on sera from four cases at Malvern showed results with Type A strain antigens similar to those in the Tables.

Preventive Measures

Early diagnosis and rapid isolation of the patient were aimed at in order to check the spread throughout each unit. Strict attention was paid to the adequate ventilation of barrack rooms and to the spacing of beds to the optimum. General measures on the maintenance of the health of the troops, the shaking and airing of blankets in the open, and the sweeping of floors, previously sprinkled with water, were adopted. Routine gargling and the spraying of rooms with disinfectant were not carried out, nor was prophylactic inoculation attempted. Unit cinemas were closed for a short time in two areas at the height of the outbreak, but the numbers of cases occurring did not warrant restricting the movement of troops or cancelling the intake of National Service men to training establishments.

The movements of the first three cases occurring in each unit prior to the onset of symptoms were investigated, with, however, inconclusive results. No direct connexion with the European epidemic could be traced.

Summary

An outbreak of influenza of the Virus A type occurring in Army units in Wales and the West Midlands is reported. Symptoms, treatment, laboratory investigations, and preventive measures adopted are described.

Our thanks are due to Lieutenant-General Neil Cantlie, C.B., *M.C.*, K.H.P., Director-General Army Medical Services, and Major-General R. W. Galloway, C.B., C.B.E., D.S.O., K.H.S., D.D.M.S. Western Command, for permission to publish this report.

SPONTANEOUS INTRA-ABDOMINAL HAEMORRHAGE

BY

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AND

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Spontaneous intraperitoneal haemorrhage—i.e., that occurring without any obvious cause such as cirrhosis of the liver (James, 1930) and rupture of aneurysm—has been recorded in 26 cases*—19 collected by Berk, Rothschild, and Doane† (1941), three reported by Marks and Freedlander (1945), and one each by Keusenhoff (1934), Matheson (1934), Crile and Newell (1940), and Haugen (1944).

In only eight of these cases were necropsies performed. In Keusenhoff's case and in two cases recorded by Moorehead and McLester (1936) a definite arterial rupture was found; but in the remaining five no single vessel could be held responsible, though in Matheson's case the haematoma was related to the branches of the ileocolic artery. Four of the cases had clinical or morbid anatomical evidence of hypertension (Moorehead and McLester two, and the fatal case of Marks and Freedlander) or arteriosclerosis (Keusenhoff). Haugen's case, which followed appendicectomy, like those of Matheson (1934), Churchman (1911), and Hartley and MacKechnie (1934), showed no evidence of vascular disease, but in these cases blood-pressure readings before the catastrophe or reports on the histology of the kidneys are lacking.

Three cases of spontaneous abdominal haemorrhage, two of which included a haemoperitoneum, are described below.

Case 1

A woman aged 58 was admitted with a four-months history of discharging ear (? cerebral abscess). She had had pain in the left hypochondrium for one month accompanied by vomiting when severe. Investigations before admission showed: haemoglobin, 66%; leucocytes, 17,300 per c.mm. (89% neutrophils); serum Wassermann reaction, negative.

On examination the temperature was 99° F. (37.2° C.), pulse 110. She had a profuse discharge from the right ear, and diplopia on looking above the horizontal. The abdomen appeared normal. The B.P. was 140/80. Leucocytes numbered 43,000 per c.mm. Two days after admission she had severe upper abdominal pain and urge to defaecate, but the bowels were not opened. On examination she was pale, the pulse was 160, and there was extreme tenderness in the upper half of the abdomen. She died in less than an hour.

Necropsy.—Intracranial disease was not discovered. Very marked purulent bronchitis and emphysema were found. On opening the abdomen large blood clots were seen in the peritoneal cavity. The greater omentum and lesser sac also contained blood clot. Careful dissection of the branches of the coeliac axis, the superior mesenteric artery, and the tributaries of the portal vein failed to reveal any macroscopic evidence of structural change in their walls or of thrombosis. Smaller vessels within the area of haemorrhage in the pancreas were also minutely examined without any abnormality being detected. Both renal arteries contained thrombi, the kidneys appearing very pale but otherwise normal. The bowel contents were black, but there was no macroscopic lesion in the intestinal mucosa.

Histology.—Omentum:—A huge area of haemorrhage occupied the omental fat tissue, which included a central area of

*Since submission of this paper a case of malignant hypertension with haemoperitoneum has been published by De Navasquez and French.

†The case of Florence and Ducuing (1913) was traumatic.

haemorrhagic necrosis. This area was surrounded by macrophages containing haemosiderin. Outside the haemorrhagic areas the arterioles showed fibrinoid thickening of the intima, and collars of lymphocytes, eosinophils, and macrophages. In addition, several islets of haemopoiesis were found. *Myocardium:*—Only the vascular changes were striking. The arterioles showed subintimal swelling, sometimes in the form of appositional loosely woven pink cushions and sometimes in the form of intensely eosinophil hillocks over which endothelial cells appeared unusually prominent and sometimes detached. *Spleen:*—There was very extensive and marked hyaline fibrinoid infiltration of walls of arterioles with reduplication of elastic laminae of some vessels. *Pancreas:*—Marked hyalinosis of arterioles was present. Stroma was rich in fat grapes and contained extensive areas of haemorrhage. *Stomach:*—Arterioles of outer layers of wall, outside and in the periphery of blood clot, showed marked hyaline fibrinoid infiltration. Innumerable collagen shreds could be seen in the clot. *Kidney:*—A fair number of glomeruli showed hyalinosis of the afferent arterioles. Many glomeruli appeared enlarged, with fusion and hyalinization of loops and increase in nuclei. There were tubular casts but no crescent formation. An occasional glomerulus showed fibrinoid change in some of its loops. Another section showed several collections of lymphocytes, the most conspicuous being around a hyalinized vessel the lumen of which was completely occluded by hyaline material, part of which showed fibrinoid change.

Comment.—Necropsy revealed no intracranial lesion and no source for the haemorrhage. Histologically there were widespread arteriolar thickening and kidney changes, as normally seen in hypertension, to which the massive intraperitoneal haemorrhage may therefore be attributed, in spite of the readings, which were, however, taken only after the onset of the disease. That the arteriolar changes may have given rise to the haemorrhage is possible, especially as similar lesions occurring in dermatomyositis have been shown (Pagel, Woolf, and Asher, 1948) to lead to extravasation of blood, though this was admittedly microscopic. Goldblatt's (1938) finding of petechial and larger haemorrhages in dogs with experimental malignant hypertension provides further support. The petechial haemorrhages in such cases were associated with dissection of necrotic or hyalinized arteriolar walls by red blood corpuscles. On the other hand, the possibility of a haemorrhagic diathesis may be considered, although Bruce's (quoted by Berk, Rothschild, and Doane, 1941) similar case with recovery was subsequently investigated for bleeding tendency without success. Multiple small discrete haematomata in the greater omentum and mesentery in Hartley and MacKechnie's case, however, suggest that their patient may have had a haemorrhagic diathesis.

The following case of abdominal haemorrhage affecting chiefly the ilio-psoas muscle, though lacking a haemoperitoneum, showed in other respects a striking resemblance to Case 1, and is therefore included.

Case 2

A woman aged 65 had had rheumatoid arthritis for eight years, and recently the onset of dyspnoea, nycturia, and swelling of the feet. On examination myxoedema, congestive cardiac failure, and advanced rheumatoid arthritis were found. The B.P. was 180/100. She collapsed and died two days after admission.

Necropsy.—Very pale and thin body. Basilar artery and circle of Willis showed severe atheroma. Right pleura adherent and oedematous, with numerous small haemorrhages (up to 0.4 cm. diameter), marked left ventricular hypertrophy, and atheroma of endocardium below aortic valves. Severe atheroma of coronary arteries. Femoral arteries showed medial sclerosis. Kidneys granular, with variegated cortex. There were extensive areas of intramuscular haemorrhage up to 5 by 4 cm. diameter in the superficial portions of the rectus abdominis and in the ilio-psoas muscles.

Histology.—Psoas muscle:—There was a massive haemorrhage beneath the fascia but no appreciable haemorrhage in the muscle itself. In addition to the extensions of the extravasation along the interfascicular stroma there were striking cellular and muscular changes. (*a*) The *cellular* changes consisted of dense perivascular and interstitial infiltration with plasma cells and lymphocytes, the former being predominant around the vessels, which, though for the most part appearing normal or showing slight fibrous thickening, occasionally showed intensely eosinophil eccentric intimal cushions as described in the myocardium in Case 1. (*b*) The *muscular* changes occurred only between the strata of extravasated blood, and consisted of vacuolation and shrinking of sarcoplasm with evidence of cellular regeneration. *Heart muscle:*—Conspicuous eccentric subintimal cushion formation in small arterioles. *Kidney:*—Extreme glomerular hyalinization of the wire-loop type, many glomeruli being completely atresic. There was also atrophy of the renal tubules.

Comment.—The presence of severe arteriolar disease and the clinically observed hypertension suggest a primarily vascular cause for the haemorrhages in this case. This is corroborated by the confinement of the pictures of muscular degeneration to the haemorrhagic areas. The perivascular, lymphocytic, and plasma-cell cuffing in the area of haemorrhage in these two cases is probably a local reaction to the latter, and is described in cases of perirenal haematoma by Heilmann (1930).

Case 3

A man aged 63 was admitted two hours after an acute onset of pain in the right hypochondrium radiating to the right scapular angle. The pain was dull and continuous, and he felt as though blown up with wind. There was slight nausea but no vomiting. A similar attack a year previously, diagnosed as a coronary thrombosis, cleared up after a week in bed.

On examination he was seen to be obese and pale, and he was sweating. The pulse was 72, temperature 97° F. (36.1° C.), and respirations 20. The blood pressure was 220/125. The abdomen was distended and tympanitic, without shifting dullness. There was tenderness but no rigidity in all areas, most pronounced in the right upper quadrant and extending round the flank to the right loin. Peristalsis was diminished. Rectal examination showed no abnormality and the urine was normal. On two occasions after admission he suddenly became shocked and his blood pressure fell to 60/40 but with a pulse rate of only 80. On each occasion he recovered in a few hours. On the afternoon following admission the tenderness and the gnawing pain were localized to the right iliac fossa. Laparotomy was performed for "acute appendicitis." There was much free blood in the peritoneal cavity and adhesions were present, mainly on the right side. In the right iliac fossa a fresh retroperitoneal haematoma was spreading towards the right loin, and a large boggy swelling was palpated in the position of the right kidney. Death occurred 30 hours after operation.

Necropsy.—Short, fat man. Right pararectal operation wound. *Heart:*—Weight, 800 g.; left ventricular hypertrophy. *Aorta:*—Gross atheroma. Peritoneum contained 60 oz. (1.7 litres) of fresh blood; omentum adherent to anterior abdominal wall. *Intestines:*—Gross distension; coil of terminal ileum adherent to pelvic peritoneum and obstructed by an omental band. Adhesions between gall-bladder and transverse colon. There was a large blood clot in the right perirenal fat which extended to the splenic flexure. The right suprarenal gland was expanded by a dense blood clot; external measurements 7 by 3 by 3 cm. The right kidney was surrounded by blood clot but was normal, apart from autolysis, and its capsule was intact. The renal artery was free from thrombosis, but the suprarenal artery could not be identified owing to the advanced autolysis.

Histology.—Suprarenal gland:—wholesale necrosis of the cortex, also of the capsular fat tissue. Some islets of parenchyma were still preserved in the central areas, where there was fibrinoid infiltration of the septa. With staining for elastic tissue the outlines of vein walls were visible in the centre of the blood clot.

Comment.—Perirenal haematoma was first described by Wunderlich (1856) under the title of "Apoplexie des

Nierenlagers," and was later classified into four categories by Ponfick (quoted by Coenen, 1910). Case 3 is an example of Ponfick's haematoma renis extracapsulare. Coenen, who collected 12 cases of perirenal haematoma and reported one of his own, mentions nephritis, renal sarcoma, arteriosclerosis, renal tuberculosis, chronic splenomegaly with gastritis, and haemophilia as the associated conditions. Heilmann (1930), who reported four cases of perirenal haematoma, suggests spasm of the capsular vessels as an aetiological factor. Cases of gross suprarenal haemorrhage have been reported in adults (Keele and Keele, 1942; Burnett, 1948). Eleven cases had previously been described. Only three of these cases, including those of Keele and Keele, were unilateral, as was the case under discussion, and in no instance was there a haemoperitoneum. In addition to atheroma and a possible spastic mechanism owing to hypertension, thrombosis of the suprarenal vein as in Keele and Keele's case should be considered as the proximate cause.

Summary

Three cases of intra-abdominal haemorrhage are reported. All three had evidence of hypertension.

The first case was one of spontaneous intraperitoneal haemorrhage with no morbid anatomical source for the bleeding apart from hypertensive changes in the smaller vessels.

The second case showed intramuscular haematomata; hypertensive arteriolar disease was sufficient to account for the haemorrhage.

The third case showed a haemoperitoneum from rupture of a perirenal haematoma. The origin of this is discussed. There was clinical evidence of severe hypertension.

Our thanks are due to Dr. W. Pagel for provision of material and assistance in preparation of this paper, to Dr. R. J. Porter, Dr. R. A. J. Asher, and Mr. J. D. Fergusson for the use of the clinical notes, and to Mr. L. Spain for histological assistance.

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The British Council for the Welfare of Spastics has produced an admirable pamphlet entitled "Notes for Parents on the Home Care of Children Handicapped by Cerebral Palsy." It has been prepared by Dr. J. H. Crosland, of the Physical Medicine Department, Charing Cross Hospital, and Mr. H. P. Weston, executive secretary of the council. After a short account of the causes and nature of cerebral palsy the authors describe in detail how to care for spastic and athetoid children, while emphasizing that they must not be coddled. While these children must receive what help they need, the parents' natural anxiety should not prompt them to make their children over-dependent. Self-confidence and a sense of security must be inculcated into the children, and there are illustrations of special furniture, toys, and feeding utensils that will help the children to live as independently as possible. Special sections are included on the training of speech and excretion. Particulars may be obtained from the council's honorary executive secretary at 107, Norfolk Avenue, Sanderstead, Surrey. The pamphlet is obtainable from the same address for 1s. 3d. post free.

EFFECT OF PRESSURE COOKING ON VITAMIN C CONTENT OF VEGETABLES

BY

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AND

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We have recently been investigating the effect of pressure cooking upon the loss of vitamin C in vegetables. As it may be some time before we can continue this work, and as there is considerable topical interest in the question, the results so far obtained are here briefly reported.

Method

In order that the results may be interpreted readily, we have compared the effects of pressure cooking with those of cooking in an ordinary saucepan. Since it is known that factors such as the volume of water and the period of cooking greatly affect the loss of vitamin C in the saucepan, the method adopted was that known to conserve the vitamin as much as possible. This method, advocated by the Ministry of Food, involves the use of a small volume of water, bringing this to the boil before putting in the vegetable, and cooking for the minimal time. With one exception, 200 g. of vegetable was cooked in 200 ml. of water in the saucepan, as this was found to be the minimal amount of liquid necessary to prevent the saucepan boiling dry. The exception was spinach, to which, as in common practice, water was not added.

The pressure cooker used was one of the now popular variety with a capacity of 7 pints (3.96 litres). The vegetables were cooked in this according to the directions supplied by the manufacturer. Again 200 g. of vegetables was used, but only 100 ml. of water. A larger volume of water is unnecessary, and would undoubtedly result in a greater loss of vitamin C by leaching. Care was taken to avoid overcooking with either method.

In every experiment six samples of each raw vegetable, so far as possible equivalent and representative, were taken. Two were for the determination of the initial content of vitamin C, two for the pressure cooking, and two for saucepan cooking. Two different portions of each raw sample of vegetable and three of each cooked sample were taken for analysis. The vitamin C was also assayed in the cooking-water. Thus for every experiment 20 samples were assayed, each assay being made in duplicate. In all, 14 experiments were performed on 10 different vegetables. The method of estimation used was that of Harris and Olliver (1942).

Results

In view of the varying nature of different vegetables and of different specimens of the same type, it was not to be expected that the variation in results between the two methods of cooking would be uniform. In all of the 10 vegetables examined there was no evidence that saucepan cooking was better than pressure cooking in retaining vitamin C. In six vegetables—cauliflower, broccoli, winter cabbage, new carrots, turnips, and swedes—the retention was consistently better in pressure cooking by between 5 and 28% of the original amount of vitamin C. In the other four vegetables—spring cabbage, broad beans, old carrots, and spinach—pressure cooking gave a slightly higher retention in some experiments and a slightly lower retention in others. The average difference in

these instances was always small—of the order of 5% in favour of the one or the other method. The average retention of the original vitamin C in all the experiments performed was 7.5% more in pressure cooking than in saucepan cooking—66% against 58.5%.

The estimations of vitamin C in the cooking-water showed that, with the exception of spinach, there was a greater loss by leaching in the saucepan than in the pressure pan. The results with spinach were no doubt due to the fact that no water was added to the saucepan, whereas 100 ml. was added in the pressure cooker. It is often recommended that the water used in cooking vegetables should be used in soups, stews, and gravies. This is, however, not often done, and when it is the liquid is frequently kept for some time and then cooked again. If it were to be used immediately the difference in the total ascorbic acid in the vegetable and cooking-water together would be negligible when comparing the two methods of cooking. In other words, the total amount of the vitamin in the vegetable and cooking-water together was on the average almost the same in the two forms of cooking (78% pressure cooking; 79.6% saucepan cooking).

Discussion

This investigation is of necessity limited by difficulties peculiar to any attempt to bring laboratory methods to domestic problems. On the one hand, it is clearly necessary to control as many factors as possible by using standardized conditions; on the other hand, it is obvious that no two housewives will cook in identical conditions; in fact, these conditions will differ from time to time even in one kitchen.

In the controlled conditions we have used it is evident that, so far as the retention of vitamin C is concerned, pressure cooking is certainly no worse than cooking in a saucepan, and in some instances is better. The differences are small, however, so that a bad technique with either method would result in a greater loss of the vitamin with that method. In some of our work, overcooking in the pressure cooker or a longer time in reaching the necessary pressure led to an appreciably greater loss of vitamin. Again, in what is still, unfortunately, the common way of cooking vegetables in a saucepan, with large volumes of water and a tendency to overcook, there is a greater loss of vitamin C than in the Ministry of Food method used in these experiments. It is probable, therefore, that either type of cooking in the home will often cause greater loss of vitamin C than in our experiments. This is more likely to occur when the saucepan is used: overcooking of vegetables in the pressure cooker results so easily in disintegration that housewives soon learn to avoid this, whereas slight overcooking with a large volume of water in the saucepan results in no obvious loss in appearance or palatability. We may reasonably conclude that, in general, the retention of vitamin C in vegetables in pressure cooking is likely to be no worse, and will probably be better, than in the saucepan when either process is used in the home. There is certainly no reason, from our experiments, to suppose that pressure cooking should be discouraged because of its effect upon the nutritive value of vegetables.

So far as other foods and vitamins are concerned, very little has been published. A few experiments of our own on the vitamin B_1 content of pulses suggest that the pressure cooker is better than the saucepan.

Summary

A comparison has been made of the effect upon the retention of vitamin C in 10 different vegetables when cooked in a modern pressure saucepan and in an ordinary saucepan according to the recommended methods. On the average the retention was higher in vegetables cooked in the pressure cooker.

We should like to thank Professor John Yudkin for his counsel, and the Ministry of Food for cooking some of the samples.

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SPERMATOLYSIS: A CAUSE OF MALE STERILITY

BY

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Much attention has been directed of late towards the problem of sterility and infertility. In consequence I have been stimulated to present the results of some studies on male sterility which suggest a causative factor not hitherto described.

During the investigation of 75 males complaining of sterility at the urological clinic of Dr. A. E. Gussel, in the Guraba Hospital, Istanbul, I came across two specific abnormal spermatozoon types which were thought to be the cause of the sterility. The purpose of this communication is to call attention to the abnormalities. Short summaries of five of the case histories are given.

Case Reports

Case 1.—H. T., married five years; no children; wife pronounced normal by the gynaecologist. No history of venereal disease. No physical abnormality present. Examination of sperm 30 minutes after collection showed no microscopical or macroscopic abnormality. After two hours the specimen was separating into two layers—a clear supernatant and a sedimented layer. Microscopically the clear layer was acellular, but the sediment contained aggregations of dying spermatozoa. (I intend to make some observations on the death of spermatozoa in a further paper.) As time passed fewer and fewer sperms were seen, until at the end of six hours none were visible—the phenomenon of spermatolysis. Furthermore, the fluid obtained from this patient by prostatic massage caused spermatolysis to occur in the semen of a normal control when added to the latter.

Case 2.—N. O., married four times in the previous twenty years. One of his former wives had remarried and had had a family. No previous venereal disease, and no abnormal physical findings. The seminal fluid appeared to be more viscous than normal, but microscopically it seemed normal in every way up to two hours, when agglutination was beginning. After six hours spermatolysis was complete as in Case 1, and again prostatic fluid from this case caused spermatolysis when added to a normal control seminal fluid.

Case 3.—H. D., aged 34; married eight years; no history of venereal disease; wife normal. A spermiogram showed oligospermia and hypokinesia. In two hours spermatolysis was complete.

In these three cases aspiration of the epididymis was performed. Unfortunately no sperms were found in any of the specimens, but in Case 3 minute comma-shaped bodies about 2 by 4 μ were seen. They showed some brownian movement. I got the impression that they were microsperms. Within two hours they had undergone lysis. In normal cases spermatozoa aspirated from the epididymis live two to three days.

Case 4.—F. O., aged 32; married three years; history of gonorrhoea twice, with clinical cure; no evidence of epididymitis or prostatitis; wife normal. Semen appeared normal

but showed asthenospermia microscopically. In five hours spermatolysis was complete, but in this case the prostatic fluid had no effect on a normal seminal fluid.

Case 5.—H. O., aged 30; married eight years. Nothing relevant in the history, and physical examination normal. Asthenospermia was present, and spermatolysis was complete in two hours.

Study of these cases suggests that two abnormal spermatozoon types were concerned. In the first type, as exemplified by Cases 3, 4, and 5, oligospermia and hypokinesia were present. Can it be assumed that the factors causing this also caused the spermatolysis? In the second type, as in Cases 1 and 2, the only abnormal feature was the spermatolysis. In all cases it seems right to assume that the spermatolysis was the cause of the sterility, since any sperm undergoing lysis within four to six hours of ejaculation is not likely to fertilize an ovum.

If spermatolysis occurs, then it seems reasonable to suggest that there must be a spermatolysin. In Cases 1 and 2 the only abnormality was spermatolysis, yet prostatic fluid from them caused lysis in the seminal fluid of normal controls. I have concluded that the prostatic secretion of these men contained a "spermatolysin" substance. The epididymis, vas deferens, seminal vesicle, and prostate produce a secretion which nourishes the sperms. Changes in the nature of the trophic products, the result of infection or from unknown causes, can give rise to abnormalities of the spermatozoa—e.g., asthenospermia—but I believe that the actual lysin factor is an abnormal prostatic substance.

Summary

Some cases of sterility in the male are due to agglutination and dissolution of the spermatozoa within a short time of ejaculation. This is spermatolysis.

Spermatolysis was thought to be the cause of sterility in five of 75 cases investigated. In two of these five no abnormality of the sperms apart from lysis was present.

The importance of examining seminal fluid at intervals is stressed. Otherwise if only one examination is done, and that too early, the phenomenon of spermatolysis might not be recognized.

Spermatolysins may be associated with otherwise normal spermatozoa or with abnormal sperm types. In the latter case it may be that a lysin factor is produced in the epididymis, vas deferens, or seminal vesicle, as well as in the prostate.

Medical Memorandum

A Case of Diabetic Coma Treated with 56,000 Units of Insulin

The following notes concern a case of diabetic coma treated at the General Hospital, Jersey. Their interest lies in the dose of insulin given and the conclusions they suggest concerning the use of glucose in diabetic coma.

CASE HISTORY

The patient, a man aged 32, a known diabetic, had previously kept well on a dose of 26 units of P-Z insulin and 16 units of soluble insulin. On Nov. 1, 1948, he had a cold; the following day he felt worse and omitted his insulin and took no food.

At 3 a.m. on Nov. 3 he was admitted to hospital in diabetic coma. Dehydration, air hunger, and the smell of acetone were conspicuous. The urine was "brick red" to Benedict's test and laden with acetone. The temperature was 98.6° F. (37° C.), pulse 102, and respirations 24. Gastric aspiration resulted in about 4 pints (2.28 litres) of dark-brown fluid. 130 units of insulin were given, and an intravenous drip of 5% glucose and 0.5% saline was set up. The blood sugar (B.S.) on admission was 500 mg. per 100 ml. Between 7 a.m. and 4 p.m. 950 units of insulin were given. At 6 p.m. the B.S. was 450 mg. per 100 ml. The pulse had risen to 130 and the patient's condition was worse.

In view of the inefficacy of the above method of treatment it was decided to change to that advocated by Professor Micks. As will be apparent, the inadequate treatment hitherto had permitted a marked state of insulin resistance to occur. At 7 p.m. the glucose drip was replaced with saline. A dose of 500 units of insulin was given and thrice repeated. The B.S. fell to 280 mg. 10,000 units were given at 1.30 a.m.: B.S. 270 mg. At 2.30 a.m. the B.S. had risen to 280 mg. and the patient had collapsed, the pulse being barely perceptible. At the suggestion of the laboratory technician the drip was investigated and was found to have been replenished in error with 5% glucose about an hour previously. The error was remedied and the patient improved.

At 3.15 a.m. 20,000 units of insulin, occupying 250 ml., were injected into several muscle masses, and 400 units into the drip tubing. At 4 a.m. the B.S. was still 280 mg. A second dose of 20,000 units was given and, since soluble insulin was running short, 400 units of P.Z.I. This proved to be the final dose. In 26 hours 56,080 units of insulin had been given.

Hitherto the urine (tested hourly) had been continuously "red" to Benedict's test and "acetone + + +." Now at last it began to become concentrated, and sugar and acetone to diminish. It did not become free from sugar and acetone till 22 hours after the last dose of insulin. The B.S. at 8.30 a.m., four hours after the last dose, was 65 mg., the pulse rate 160; the latter thereafter fell steadily and 24 hours later it was 90. No sudden change in the patient reflected the fall in blood sugar. Following the 8.30 a.m. B.S. result, glucose in amounts varying from 5 to 15 g. in 25% solution was administered hourly by drip tubing.

At 5 a.m. on Nov. 5, 25 hours after the last dose of insulin, a hypoglycaemic convulsion occurred without warning. It responded instantaneously to intravenous glucose. Shortly after this the drip was changed to glucose. By evening on the same day the patient was restored to consciousness sufficiently to take additional glucose by mouth. By about 11 p.m., some 65 hours after admission and 43 after the last dose of insulin, he was perfectly *compos mentis*. The drip was discontinued next day, and the patient was nursed flat for three days as a precaution against sudden circulatory failure. He progressed steadily and was discharged on Nov. 25, feeling perfectly fit, on a morning dose of 40 units of P.Z. and 60 units of soluble insulin.

COMMENT

It is to be supposed that the patient's descent into coma was initiated by the cold he had on Nov. 1. No trace of this or evidence of any other infection was apparent on admission. I had expected the conversion of the B.S. from high to low values to be indicated by marked clinical change. A sharp rise in the pulse rate coincided with the event, but this was the only prominent point. The pulse rate and the urinary sugar and acetone gradually diminished, and the patient's general condition slowly improved. Even the hypoglycaemic convulsion, arriving late and without warning and immediately controlled, did not seem to interrupt this steady progress.

B.S. recordings during this period may be of interest. These were: 5 hours after the last dose of insulin, 65 mg. per 100 ml.; 7 hours after last dose, 56 mg.; 8 hours, 50 mg. (here the drip was changed to glucose); 10 hours, 62 mg.; 12 hours, 30 mg.; 14 hours, 50 mg.; 16 hours, 24 mg. (no clinical reflection of this low value); 27 hours, 70 mg. (convulsion two hours before this); 29 hours, 60 mg.; 32 hours, 45 mg.; 34 hours, 168 mg.

The lack of response to treatment when glucose was used, the collapse that occurred when it was added in error to the saline drip, and the recuperation that followed the correction of the error, strongly suggest that glucose is not an innocuous substance in diabetic coma and that its use as a precaution against hypoglycaemia may gravely jeopardize the patient's chances of survival. This was emphasized by Root (1945) and Micks (1948).

Gastric aspiration on admission produced brown fluid containing altered blood. A second aspiration twelve hours later yielded about 1 oz. (28 ml.) of blackish fluid, presumably also blood further altered. This, I believe, is a usual occurrence in diabetic coma. I should be interested to know the cause and origin of this blood. I understand that a surgeon operating on a case of chronic pyloric stenosis may occasionally observe blood oozing from the gastric mucous membrane.

I wish to thank Dr. Graeme Bentlif, senior physician to the General Hospital, for permission to publish these notes.

J. G. H. SHEPPARD, M.B., B.S.

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Root, H. F. (1945). *J. Amer. med. Ass.*, **127**, 357.

Reviews

FEMALE REPRODUCTIVE TRACT

The Epithelia of Woman's Reproductive Organs. By George N. Papanicolaou, M.D., Ph.D., Herbert F. Traut, M.D., and Andrew A. Marchetti, M.D. (Pp. 53; 22 Plates. 55s.) New York: The Commonwealth Fund. London: Geoffrey Cumberlege. 1948.

Most of this monograph is on the cytological appearances of the normal epithelia of the female reproductive tract. Dr. Papanicolaou is world-famous for his studies in this field and his present collaborators have been associated with him in much of his work. The monograph is a triumph of transcontinental collaboration, since almost half-way through the ten years devoted to collecting material Dr. Traut left Cornell University to become professor of obstetrics and gynaecology in the University of California.

Discussion of all the normal epithelia from the ovary to the vagina occupies 48 pages. Every one of them is packed with detailed information, not only on the cytology of the tissues but on the correlation of the changes which take place throughout the female genital tract as a whole at the different phases of the menstrual cycle and in the menopausal woman. It is clearly shown that all the epithelia take part in these cyclical changes and that the changes in the Fallopian tubes, cervix, and vagina, though less well known than those in the ovaries and endometrium, are nevertheless completely characteristic to the eye of the expert cytologist. The illustrations are beautifully produced and lend the highest distinction to the work as a whole. Most are in colour; they consist of photomicrographs of admirable clarity and excellent drawings by Hashime Murayama. No doubt the high quality of the production is reflected in the price, though it is difficult to produce work of this kind, which depends so largely on accurate illustration, on a less lavish scale.

This monograph will prove an admirable companion to that published five years ago by Dr. Papanicolaou and Dr. Traut on the diagnosis of uterine cancer by the vaginal smear. Their pioneer work in this field is too well known to need further comment, but anyone who wishes to learn this difficult but fascinating method of gynaecological investigation will find these two monographs indispensable. There is no doubt that the vaginal smear will very soon be universally recognized as a routine procedure in gynaecology.

The absence of an index is to be regretted, especially in a work where so many cross-references are to be found. The chart given at the end of the book, however, affords an admirable summary of the changes in the menstrual cycle to be seen not only in the epithelia but in the basal-temperature chart and the hormone-excretion levels. It also serves to emphasize again the main theme, which is that of correlation of cytological changes with function.

JOSEPHINE BARNES.

ATLAS OF ANATOMY

Living Anatomy. A Photographic Atlas of Muscles in Action and Surface Contours. By R. D. Lockhart, M.D., Ch.M. (Pp. 71; 149 figures. 12s. 6d.) London: Faber and Faber. 1948.

This is a photographic album of "the muscles in action and surface contours" by the staff and students of the anatomy department at Aberdeen. It consists of about 150 photographs, mainly of the superficially placed muscles of the trunk and limbs in different subjects of both sexes. The brief introduction and the photographs will succeed in diverting the attention of the student from the textbook description and the dissecting-room appearance of the muscles. The photographs are instructive, though some criticism may be made of many of the poses in that the subject is shown performing somewhat unusual actions against the resistance of the restraining hands of the master of ceremonies.

The most superficial of all muscles, and among the first to be developed in the embryo, is the platysma. This muscle is not figured. In its extreme contraction its longest fibres are capable of moving the nipple over one to two rib spaces in the male and even more in the female. Putting this muscle into violent contraction is often of use in examining the female breast for the site, size, shape, consistency, and attachments of a tumour. From the purely artistic point of view there is nothing to approach Paul Richer's *Anatomie Artistique*, which is the best delineation and description of the external form of the muscles at rest and in action. It also is the best portrayal of those fat deposits which lend beauty to the female form.

This album has certainly instructed and entertained the students of Aberdeen. It may stimulate others to the point of reading Duchenne and Beevor, who are gratefully mentioned in the preface.

H. A. HARRIS.

EPILEPSY

Epilepsy. Psychiatric Aspects of Convulsive Disorders. By Paul H. Hoch, M.D., and Robert P. Knight, M.D. Proceedings of the 36th Annual Meeting of the American Psychopathological Association. May, 1946. (Pp. 214; illustrated. 21s.) London: William Heinemann Medical Books. 1948.

This volume contains fifteen chapters by different authors, each discussing some facet of the problem—genetics, prevalence and incidence, social implications, psychopathology, diagnosis, E.E.G., and so on. It records the proceedings of the annual meeting of the American Psychopathological Association in 1946, so that the psychiatric aspects of epilepsy are naturally discussed at greater length than they would be in a balanced monograph on the subject. The divergence of psychiatric opinion on the psychopathology of epilepsy may be illustrated by two statements by different contributors to this book; the first is that epilepsy, like other manifestations in human life, is a way of expression and living through the stresses and strains of life; the second is that the notion that epileptic seizures may be merely an exaggeration created by difficulties of adjustment to life has been abandoned. It is at any rate satisfactory to have both views presented, so that the reader may decide on the evidence provided for him whether the epileptic attack represents an escape from an unbearable situation, a functional disorder of the brain, or perhaps a little of both.

As might be expected in a volume of this kind, the contributions vary in quality. The one on the antisocial aspects of epilepsy makes no attempt to deal with the practical problem of criminal responsibility, and in some of the others there is a great deal of theorizing about very little. There are, however, interesting and up-to-date accounts of the application of the Rorschach test to the delineation of the so-called epileptic personality, and of experimentally produced epilepsy in animals. Patton describes sound-induced convulsions in young albino rats with diets lacking in pyridoxin or magnesium. Kopeloff and his colleagues write of a continued epileptic liability in the monkey induced by the application of alumina cream to the cortex; it seems to be independent of the histological character of the lesion, and is of interest in relation to the observed frequency of epilepsy in man in certain cerebral diseases, such as cysticercosis. Jasper, in a brief but lucid review of the E.E.G., states his reasoned opinion that the terms grand mal and petit mal should be used as of old to describe the clinical manifestations of epilepsy and should not be tied to specific E.E.G. patterns. Diethelm's thoughtful essay on differential diagnosis is of particular value for the clinician. He records the recall or partial recall under hypnosis of post-epileptic amnesias and considers that fugues occurring in psychopaths may be indistinguishable from epileptic attacks. For this chapter alone the book is worth referring to by every serious student of the subject, and he will doubtless find other matter in it which will engage his particular interest.

CHARLES SYMONDS.

FAILURES IN TREATMENT

Failures in Psychiatric Treatment. Edited by Paul H. Hoch, M.D. (Pp. 241. $4.50.) New York: Grune and Stratton. 1948.

In this book are collected the papers presented to the annual meeting of the American Psychopathological Association in 1947. The features which must have made the symposium

interesting and stimulating at the convention in 1947 are to some extent lost in print. There is not enough in common between the various themes, such as insulin shock therapy, the treatment of neurosyphilis, and social case-work, for the whole collection to be anything but a psychiatric scrapbook. Some original data are reported, among which are Dr. Kallmann's three pairs of uniovular twins, whose different fates under the impact of schizophrenic psychoses seemed to be determined by variations in body weight. Dr. Kallmann cites them as evidence for the contention that a genetical approach, rather than stultifying therapy, may suggest new lines of therapeutic attack. In his introduction Dr. Nolan Lewis also refers to the neglect of hereditary factors as a possible cause for failures in treatment, to the existence, besides deep analysis, of other methods of psychotherapy perhaps insufficiently exploited, and to the amount of poor psychotherapy that is given; the schools, he says, are being swamped by students anxious to enter this remunerative field.

The editor sums up and tries to draw some general lessons. He finds it necessary to re-emphasize the importance of accurate diagnosis for successful therapy, and to point out once again that "motivology" and "aetiology" are two different things. The symposium provides the encouraging suggestion that American psychiatry as a whole is retreating a little from the extreme psychodynamic attitude to causation, and that a less fanatical and more medical atmosphere is beginning to appear.

ELIOT SLATER.

PRIMARY TUBERCULOSIS

Die primäre Tuberkulose bei Erwachsenen und Kindern und ihre Entwickelung. By Dr. St. J. Leitner and Dr. R. M. Steinmann. (Pp. 158; illustrated. 15 Swiss francs.) Berne: Medizinischer verlag Hans Huber.

The authors give a clinical study of primary tuberculosis in 160 adults and 106 children, the cases being followed up for a period of two to eight years. They emphasize that sanatorium treatment should continue until the radiographs no longer show infiltrative changes. These take much longer to disappear than does the acute pneumonic and influenzal picture so often simulated by primary tuberculosis in adults as well as in children. Erythema nodosum was common (33.7% in adults and 6.6% in children); so was pleural effusion (31.8% in adults, 21.7% in children; bilateral in 8 adults). Discussing the relationship between primary tuberculosis and phthisis, the authors consider to be important the frequent observation of an early post-primary spread to the apices. They saw progressive tuberculosis develop from such disseminated foci (i.e., an endogenous source) twice as often as from the primary focus itself. Progressive pulmonary changes following early cavitation of the primary focus or of daughter foci occurred without any recognizable cause —regardless of therapy—and took a rapid and unfavourable course. Those, however, which developed after a longer interval were due to factors weakening general resistance and were quite amenable to therapy.

The authors present their material well and cover most of the clinical aspects. Their references to the literature are occasionally erratic and many papers discussed are redundant. On the other hand, the study of Frimann-Dahl and Waaler should have been mentioned, because it was the first to draw attention to the recent dramatic shift of primary infection to adult age groups; nor have they mentioned the extensive discussion of the whole problem held at the Royal Society of Medicine in 1942. There are hardly any observations on pathology, and the authors have not always made use of the pertinent morbid-anatomical facts. For example, we miss a discussion of recrudescence of primary foci as a source of phthisis; it often bridges the long interval between primary infection and phthisis and disposes in such cases of the theory of "exogenous superinfection." These few points, however, do not detract from the distinct value of the book. It lies in its clinical observations and in the demonstration that there is no essential feature in which primary tuberculosis in adults differs from that in children.

W. PAGEL.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Aero-otitis Media and Aerosinusitis. By G. K. Aschan (Pp. 93. No price.) Uppsala: Almqvist and Wiksells. 1948.

An account of experimental histopathological changes due to oxygen deficiency and oxygen poisoning.

Aids to Physical Chemistry. By R. G. Austin, B.Sc., F.R.I.C. 2nd ed. (Pp. 443. 7s. 6d.) London: Baillière, Tindall and Cox. 1948.

An outline for students.

Failure of the Heart and Circulation. By Terence East, M.A., D.M., F.R.C.P. 2nd ed. (Pp. 144. 6s.) London: Staples Press. 1948.

A concise practical account.

There's No Need to Shout. By F. Warfield. (Pp. 152. 8s. 6d.) London: Victor Gollancz. 1949.

The autobiography of a partially deaf woman.

The Child: An Adult's Problem. By A. M. Ludovici. (Pp. 288. 10s. 6d.) London: Carroll and Nicholson. 1949.

Bringing up children discussed for parents and teachers

Experimental Diabetes Mellitus. By E. T. Bell, M.D. (Pp. 31. 7s. 6d.) Oxford: Blackwell. 1949.

A short monograph with references

Le Benzolisme. By V. Raymond and A. Vallaud. (Pp. 174. No price.) Paris: Institut National de Sécurité pour la Prévention des Accidents du Travail et des Maladies Professionnelles. 1948.

The toxicology of the benzols and an account of measures affording protection against them.

Diabetic Manual. By E. P. Joslin, M.D., Sc.D. 8th ed. (Pp. 260. 12s. 6d.) London: Henry Kimpton. 1948.

A practical guide for medical men and their patients

Frauenheilkunde. By W. Benthin. (Pp. 260. M.14.) Berlin: Urban and Schwarzenberg. 1948.

A manual of gynaecology intended for students and general practitioners.

Principles and Practice of Ophthalmic Surgery. By E. B. Spaeth, M.D. 4th ed. (Pp. 1,044. 75s.) London: Henry Kimpton. 1948.

An illustrated textbook giving details of surgical technique.

The Therapy of the Neuroses and Psychoses. By S. H. Kraines, M.D. 3rd ed. (Pp. 642. 32s. 6d.) London: Henry Kimpton. 1948.

Intended particularly for the non-specialist.

Richtlinien einer Philosophie der Medizin. By A. W. Kneucker, M.D. (Pp. 197. 22s 6d.) Vienna: Wilhelm Maudrich. 1949.

The author discusses such topics as logic, materialism, ethics, and education.

Röntgen- und Radiumbehandlung. By P. Hess. (Pp. 147. M.13.) Berlin: Urban and Schwarzenberg. 1948.

A practical account of the technique of radiotherapy.

Sex and Marriage. By N. Robertson. (Pp. 46. 2s. 6d.) London: Research Books. 1949.

A short guide to sex conduct for men and women.

Trace Elements in Food. By G. W. Monier-Williams, O.B.E., *M.C.*, M.A., Ph.D., F.R.I.C. (Pp. 511. 30s.) London: Chapman and Hall. 1949.

A study of elements which, in minute amounts, take part in animal and plant metabolism.

Hospital Trends and Developments, 1940-1946. Edited by A. C. Bachmeyer, M.D., and G. Hartman, Ph.D. (Pp. 819. 30s.) London: Geoffrey Cumberlege. 1948.

A collection of articles on hospital administration and allied subjects, selected from literature published between 1940 and 1946.

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CORONARY THROMBOSIS TREATED WITH ANTICOAGULANT DRUGS

Thrombosis of the leg veins, occurring in sick and debilitated adults, is a treacherous hazard of bed rest, unpredictable in its outcome, and at times producing by massive pulmonary embolism the tragedy of sudden death. In a paper appearing elsewhere in this issue Drs. K. P. Ball and H. O. Hughes discuss this danger and urge doctors and nurses to become more "thrombosis-minded." Many workers have now stressed the value of the anticoagulant drugs in the treatment of leg thrombosis, and it is natural that much interest should have been aroused in the possibility of using these drugs in the treatment of coronary thrombosis. Studies such as those of Nay and Barnes[1] have shown how frequently coronary thrombosis is complicated by thrombosis elsewhere. They found thrombotic or embolic complications in 37 out of 100 cases of acute myocardial infarction; 14 out of 100 had pulmonary emboli. Foord[2] found at necropsy that 48 out of 315 cases of myocardial infarction had pulmonary emboli. It is clear that a safe and effective means of preventing intravascular clotting would reduce the risk of many complicating disasters. Wood[3] has even suggested that the treatment of angina at rest with anticoagulants may prevent the onset of some cases of coronary thrombosis.

The most effective anticoagulant is heparin. The disadvantages of this substance are that not enough is produced to meet all demands, repeated injections have to be given, and it is very expensive. Dicoumarol has the advantage that it can be given by mouth, and it is less costly and more readily available than heparin, but its effect upon coagulation is only to prolong by a few seconds a certain stage in the clotting process (prothrombin time). This prolongation of a few seconds may, of course, be quite enough to reduce the chance of blood clotting as it flows over diseased vessel walls and to limit the dissemination of such clots. The greatest disadvantage of dicoumarol is its tendency to produce severe and even fatal bleeding, the avoidance of which requires careful daily laboratory control of its effect on prothrombin time. There seems at the moment to be no way of simplifying this method of treatment for widespread application outside hospitals.

Laboratory investigations have been undertaken to discover whether the anticoagulant drugs will prevent the spread of coronary thrombosis once established. Two reports[4 5] serve to show that this aspect of the problem is not likely to be settled by experimental coronary ligation in animals. There were no significant differences in the infarcts in dicoumarol-treated and untreated animals, and thrombosis in the smaller vessels within the infarcted area was found just as often in animals receiving dicoumarol as in the control group. Beattie and his colleagues[5] observed no obvious changes as a result of dicoumarol treatment in dogs with ligated coronary arteries. They emphasize, however, that the experimental procedure in previously healthy vessels is very different from the process in diseased arteries.

If possible, then, the answer must be sought in the clinical results. Glueck and others[6] have been able to compare 44 patients who received anticoagulant drugs with 44 control patients. The mortality was 45% in the untreated group and 20% in the treated group. Among the former 27% had thrombo-embolic complications, while in the group receiving anticoagulants the incidence of this complication was reduced to 7%. The widely varying outlook even in a carefully collected series such as this still leaves a little doubt, and the American Heart Association wisely set up a committee three years ago to collect more information. The investigators were a group of distinguished men whose collected evidence was obtained from the observation of 800 cases: Irving Wright and his colleagues[7] have issued a report on the findings. The routine treatment was to administer heparin for the first 48 hours, during which time dicoumarol is coming into action. Thereafter the prothrombin time was held between 30 and 35 seconds by dicoumarol. The cases numbered 368 in the control group and 432 in the treated group; age incidence and severity of the attack were comparable in the two groups. The following figures summarize the results: the percentage mortality in the treated was 14.9 and in the untreated 24; the percentage incidence of thrombo-embolic complications was 11 in the treated and 25 in the untreated; the number of thrombo-embolic complications per 100 patients was 14 in the treated and 36 in the untreated. Closer examination of the figures provides an even more favourable impression than the overall percentages. For example, about half of the treated patients who had thrombo-embolic complications such as venous thrombosis, pulmonary embolism, hemiplegia, and extension of the myocardial infarction developed them before the anticoagulant drugs had time to become fully effective. It is during the first four weeks of the illness that the treatment is most useful: after that the chances of further complications of this type seem to diminish considerably. This report from the U.S.A. is very valuable, and further information from the committee will be awaited with interest. It is to be noted that dicoumarol therapy does not wholly abolish the incidence and the complications of further clotting, but it certainly produces a significant reduction. The anticoagulant regime seems to be of established value in spite of occasional disappointments, and perhaps in time a better and safe anticoagulant will be found.

1 *Amer. Heart J.*, 1945, **30**, 65.
2 *J. Amer. med. Ass.*, 1948, **138**, 1009.
3 *British Medical Journal*, 1949, **1**, 27.
4 Blumgart, H. L., *et al.*, *Amer. Heart J.*, 1948, **36**, 13.
5 Beattie, E. J., *et al.*, ibid., 1948, **35**, 94.
6 Ibid., 1948, **35**, 269.
7 *J. Amer. med. Ass.*, 1948, **138**, 1074.

FRACTURES OF THE NECK OF THE FEMUR

Up to the end of the war of 1914–18 transcervical fracture of the neck of the femur presented an insoluble problem. Non-union was accepted as inevitable. The credit for overcoming this defeatist attitude must be given to Whitman,[1] who showed that union could be obtained by applying the accepted principles of reduction and fixation. This involved encasing the patient in a long spica plaster-of-Paris splint; the treatment was tedious and uncomfortable, and stiffness of the hip and of the knee was a common sequel. Whitman himself never published his results, but it was generally assumed that union could be hoped for in 50% of patients. Löfberg,[2] following up 153 of his own patients treated by the Whitman method, reported union in 67%, whereas an American Commission[3] which reviewed a large number of cases treated in different clinics put the number of successful unions at 30%. Surgeons, now as optimistic as before they had been pessimistic, were not satisfied with these figures and searched for a more efficient treatment.

Although internal fixation had been tried from time to time, it was not until Smith-Petersen[1] introduced his nail that pinning the neck of the femur came into fashion. Most rationally he pointed out the obvious need for preventing rotation as well as angulation of the fragments and devised his three-flanged nail for the purpose. Smith-Petersen carried out his first operations in 1925. After opening the hip-joint he reduced the fracture and inserted his pin under direct vision. The method was accepted with alacrity by surgeons all over the world. A contribution almost equal to that of Smith-Petersen was made in 1932 by Sven Johansson, of Gothenburg,[5] who conceived the idea of making a canal in the nail. After reducing the fracture by manipulation he passed a guide wire up the neck of the femur, and when the wire was shown by *x*-ray control to be well placed he threaded the canalized Smith-Petersen nail over it and hammered the nail home. This procedure avoided opening the hip-joint. Since then various instruments have been devised to enable the guide wire to be correctly placed at its first or second insertion. Probably the most popular one in use in England was that introduced by the late Hey Groves. Many surgeons, including Sven Johansson, scorn the assistance of wire introducers and prefer to rely on their eye to insert the guide wire correctly. Surgeons in different parts of the world have modified the technique—for example, by using a screw instead of a three-flanged nail or by using multiple thin nails. But transcervical fracture of the neck of the femur is now universally treated by threading a Smith-Petersen nail over a guide wire inserted up the neck of the femur into the head. Whitman's abduction-plaster method is a thing of the past.

Pinning of fractured necks of femur has now been employed long enough for the treatment to be assessed. Early enthusiasm is giving place to the sombre judgment of experience. The results obtained by Sven Johansson have lately been published by Gunnar Odén.[6] Three hundred and fourteen patients operated on between 1932 and 1941 have been followed up: 27 died at or after the operation, and, since many of the patients were elderly, 104 have died since of natural causes; of the remaining 183 Odén has examined 141, all at least three years after the date of their accident. His detailed analysis answers several questions. The immediate mortality from the injury is less in those subjected to operation than in those treated conservatively. The distinction made by Böhler between the abduction or valgus and the adduction or varus types of fracture is worth retaining. The valgus fracture is frequently impacted and may not need pinning, and whether pinned or not always unites. Johansson prefers to operate on all transcervical fractures, since an impacted valgus fracture may disimpact and become displaced. Impaction cannot be gauged from viewing the radiograph; clinical evidence on this point is alone reliable. And only when the radiograph shows bone trabeculae crossing the old fracture line can one be certain that union has occurred.

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[1] *J. Amer. med. Ass.*, 1921, **77**, 913.
[2] *Zbl. Chir.*, 1927, **54**, 2222.
[3] Report of the Fracture Commission of the American Orthopaedic Association, *J. Bone Jt Surg.*, 1930, **12**, 966.
[4] *Surg. Gynaec. Obstet.*, 1937, **64**, 287.
[5] *Acta orthopaed. scand.*, 1932, **3**, 362.
[6] *Acta chir. scand.*, 1947, **96**, Suppl. 131.
[7] *J. Bone Jt Surg.*, 1938, **20**, 108.
[8] *Pr. méd.*, 1932, **40**, 604.
[9] *Osteosynthesis colli femoris*, 1944. Copenhagen.

freely as before the accident, did not use a stick, and did not complain of pain; those at work resumed their former occupation. Another 8% were classed as satisfactory: they used a stick out of doors or had difficulty in tying their shoe-laces or complained of pain. In no less than 24% of the cases the results were classed as bad.

The bad results were due either to non-union or to osteo-arthritis of the hip-joint consequent on an aseptic necrosis of the head of the femur. Odén found evidence of aseptic necrosis, past or present, in 38% of the patients. Its frequency varied with the amount of the pre-reduction displacement, but it was commonest in those patients in whom the fragments became redisplaced; it occurred in 16 out of 20 patients who had been repinned. Spotoft[9] confirms this gloomy prognosis: he found partial or complete necrosis in 21 out of 24 repinned patients. Union may take place in spite of aseptic necrosis, for the fracture did in fact unite in more than half of Spotoft's patients. It is a common belief that aseptic necrosis is more frequent in fractures treated by pinning than in those treated conservatively, but there is no evidence to support this view. The vascular disturbance that eventually discloses itself as an aseptic necrosis of the head of the femur either dates from the time of the accident or is caused by a slow but continuous shifting of one fragment on the other. Aseptic necrosis is usually, though not invariably, associated with faulty technique and subsequent displacement of the fragments.

Is operative treatment for a fracture of the neck of the femur an improvement on Whitman's abduction method? The answer is undoubtedly yes: the mortality is no greater, the end-result is better, and the discomforts of treatment are far less. It is reasonable to assume that two out of three patients with a transcervical fracture of the neck of the femur, treated by a competent surgeon by pinning, will be as good as they were before the accident, and one of four will be left a cripple.

ADVANCES IN MICROSCOPY

In addition to the electron microscope, which is still in the hands of the specialist, the phase-contrast microscope and ultra-violet and fluorescence microscopy are rapidly enlarging knowledge of the cell and of many other structures which come within the domain of the infinitely small. The existing knowledge of the microscopic structure of cells has in the past been derived almost exclusively from the study of fixed and stained material. With the phase-contrast microscope fresh material can be carefully examined. The development and application of the phase-contrast technique to the microscope is due in the first place to Zernicke,[1 2] and its subsequent improvement by Köhler and Loos[3] has placed a valuable tool in the hands of the biologist. Those who wish to acquire some knowledge of the principles and properties of the modern phase-contrast microscope should read Taylor's[4] description of it. The important property of phase contrast lies in the conversion of phase differences into amplitude differences; the eye is sensitive only to the latter. Thus phase-contrast microscopy will reveal structures which differ in refractive index from the surrounding medium by too small a degree to be made visible by other methods. At the same time, full apertures can be employed and the maximum resolving power of the objectives under the special conditions of illumination can be brought into use. As a result definition is very greatly improved, and this, coupled with the small depth of focus, provides a picture which in detail and contrast can be rivalled only by the best histological preparations. Furthermore, material can be prepared and examined much more rapidly than by histological procedures. In common with all other methods for the study of living material phase-contrast microscopy does not differentiate between structures which differ only in chemical nature, and to be fully effective it should be used in conjunction with histological methods. Phase-contrast microscopy is of the greatest value in the study of small living cells. Austin and Smiles,[5] for instance, have studied the fertilization and early development of the rat egg. The magnificent photomicrographs with which their paper is illustrated afford an opportunity for comparing the pictures obtained by direct illumination and by the phase-contrast technique.

Greater resolution and also information about the chemical constitution of the structures studied are obtained by the use of ultra-violet light as a source of illumination, since certain organic compounds possessing specific molecular configurations absorb ultra-violet radiations selectively. The first ultra-violet micrographic equipment was designed by von Rohr[6] and Köhler[7] in 1904, but the work of J. E. Barnard was responsible for the development of this type of microscope to its present high degree of efficiency; the apparatus and technique devised by him and Welch[8] for the study of bacteria and viruses have now largely been standardized for application to living cells. Ludford, Smiles, and Welch[9] have used this technique with success in the study of living malignant cells. As a result of their investigations Caspersson's[10] conception of a "cytoplasmic protein-forming system" has had to be modified, though there is no disagreement with the general conception of the relation of nucleic acids to protein synthesis. Cytoplasmic protein synthesis probably occurs in the peripheral parts of the cell and not in the immediate vicinity of the nucleus; the site of protein synthesis may very possibly be the mitochondrial-cytoplasmic interfaces.

Fluorescence microscopy also reveals differences in the chemical constitution of cell constituents. The idea of fluorescence microscopy was first suggested in 1911. When cells are treated with a fluorescent dye and are viewed in light of certain wavelengths various tissue structures give out secondary waves. Levaditi and his colleagues,[11] for instance, have shown that when ordinary sections from paraffin-embedded material are treated with a dye such as thioflavine S and exposed to wavelengths of light at 3,600 Å a maximum secondary transmission occurs when the wavelength equals 5,150 Å. Under these conditions photomicrographs can be taken on orthochromatic plates. Cytoplasmic inclusions caused by viruses can thus be recognized visually. For instance, the inclusions produced by rabies, vaccinia, and Borna disease fluoresce with an azure blue colour, the same tint as that given out by nucleoli and red cells. Cell protoplasm, nuclei, and collagen fibres, on the other hand, are golden yellow. When viewed by fluorescence microscopy the inclusions are oval or round, without visible structure. The elementary bodies of vaccinia, fowl pox, and lymphogranuloma venereum and the intranuclear inclusions produced by herpes all have a golden-yellow tint.

1 *Z. techn. Physik*, 1935, **16**, 454, 845.
2 *Phys. Z.*, 1935, **36**, 848.
3 *Naturwissenschaften*, 1941, **29**, 41.
4 *J.R. micr. Soc.*, 1946, **66**, 1.
5 Ibid., 1948, **68**, 13.
6 *Die Theorie der optischen Instrumente*, 1904, Vol. 1. Berlin.
7 *Z. wiss. Mikr.*, 1904, **21**, 129, 273.
8 *J.R. micr. Soc.*, 1936, **56**, 365.
9 Ibid., 1948, **68**, 1.
10 *Symp. Soc. exp. Biol.*, 1947, No. 1, p. 127.
11 *C.R. Acad. Sci., Paris*, 1948, **227**, 1061.

intra-cytoplasmic virus inclusions are thus almost certainly made up of elementary bodies surrounded by or embedded in material elaborated by the cell.

PRESSURE COOKING AND VITAMINS

While the pressure cooker is no novelty, having been available in various forms for at least 20 years, it has recently attracted attention as a solution to certain domestic difficulties caused by changed social and economic conditions. Pressure cooking has the great virtue of saving time, allowing a meal of meat, potatoes, and vegetables to be cooked in about 15 minutes.

The question may be asked whether the convenience of pressure cooking is outweighed by any ill-effects on the nutritive value of the food. In a letter to *The Times* some months ago C. V. Pink[1] suggested that at least half the vitamin B_1 in food would be destroyed. He considers, therefore, that pressure cookers should not be used for routine domestic cooking, but should be kept for occasions when a meal has to be produced quickly. The source of Pink's information, however, has been questioned by Professor J. Yudkin,[2] who in preliminary experiments has found smaller losses of vitamins B_1 and C in pressure cooking than in cooking in an ordinary saucepan.

In the early days of nutritional research the favourite method of obtaining a source of B_2 vitamins free from vitamin B_1 was to submit a yeast extract to vigorous treatment in an autoclave. There is no doubt, therefore, that a pressure cooker, if improperly used, could destroy vitamin B_1 and the equally unstable vitamin C, though there would be little or no loss of the fat-soluble vitamins A, D, and E, and some of the B vitamins. The danger of overcooking, particularly green vegetables, must be much greater with the pressure cooker than with the saucepan. There can be no question of judging the condition of the food by its appearance, aroma, or softness; the cook cannot see what is going on inside her apparatus, and carelessness in timing may ruin the food in a few minutes. To compensate for this practical disadvantage, which can be overcome by strictly keeping to the recommended times, two points in favour of the pressure cooker can be claimed on theoretical grounds. First the amount of water used in operating the cooker is very small; this should reduce losses of water-soluble vitamins and other nutrients which are lost by solution. Secondly, in ordinary cooking vitamin C is wasted if the temperature is raised slowly enough to allow enzymes to destroy the vitamin before they in turn are destroyed. The very rapid heating in pressure cooking should shorten the period during which enzymes could exert their action.

So far as can be judged from the limited evidence available, pressure cooking does not cause any greater losses of vitamins than good ordinary cooking. Thus domestic-science workers[3] in the U.S.A. found that in cooking cabbage, spinach, and peas the losses of vitamin B_1, C, and riboflavin were usually about the same with the pressure cooker as with the low-pressure steamer or with a closed saucepan containing a minimum quantity of water. Total immersion of the vegetables in an open saucepan invariably caused much greater losses. Elsewhere in this issue Miss G. M. Chappell and Miss A. M. Hamilton describe their investigation of the effect of pressure cooking upon the loss of vitamin C in vegetables. They found that on the average more vitamin C was retained in the vegetables cooked in a pressure cooker than in an ordinary saucepan by recommended methods. Their experiments also indicated that the vitamin B_1 content of pulses was better preserved by pressure cooking than by ordinary cooking. Further investigations will be required to obtain an answer to the question whether heating foods of all kinds for a short time in superheated steam is more or less harmful than a much longer period at the ordinary boiling-point of water. Fortunately past research has shown that the amounts of vitamins surviving in processed vegetables have been found to run roughly parallel to taste and culinary quality. If, therefore, users of pressure cookers succeed in preparing meals which can compare favourably in appearance and palatability with meals prepared by good ordinary cooking they need have little fear of defects in nutritive value. But if misuse of the pressure cooker gradually accustoms the taste to very soft potatoes and brown, pulpy vegetables, then the risk of malnutrition is a real one.

[1] *The Times*, Nov. 23, 1948.
[2] Ibid., Nov. 26, 1948.
[3] Sutherland, C. K., Halliday, F. G., and Hinman, W. F., *Food Res.*, 1947, 12, 496.

A TROPICAL MEDICINE JUBILEE

Last year saw the centenary of public health in this country. This year is the jubilee of two important events in the history of tropical medicine—the fiftieth anniversary of the opening of the Liverpool School of Tropical Medicine and of the foundation of the London School of Hygiene and Tropical Medicine. The development of the latter was referred to last week at the annual meeting of the court of governors. In 1899 Sir Patrick Manson opened the School of Tropical Medicine at the gates of the Albert Docks. In 1924, having moved in the meantime to Endsleigh Gardens, the School amalgamated with the new School of Hygiene, and five years later the London School of Hygiene and Tropical Medicine entered into possession of its fine building in Gower Street. Afterwards came the amalgamation with the Ross Institute.

The report for the school year 1947–8, which is just issued, is a lively and interesting document. Among other special features it contains a speech by the Poet Laureate in grateful memory of Ronald Ross—"We who knew him will never forget his greatness"—and a report, illustrated by some carefully drawn cartoons, on the progress of tropical medicine during the present century. For many years the Schools of Tropical Medicine were quite alone in facing a world of problems, but now rapidly expanding research schemes are undertaken by the Colonial Office, the Rockefeller Foundation, and the World Health Organization. These larger partners, however, must not be allowed to overshadow such research schemes as have their centre in Keppel Street. The School is ready to co-operate in the greater projects, but must zealously cultivate its own field and maintain its reputation for independent work.

A study of this jubilee report shows how varied is the work undertaken. In the Department of Entomology, for example, insecticides are being scientifically investigated, and a new type of study is concerned with the relation between biting insects and mites and the animals to which they transmit infection. (This department, by the way, possesses a collection of mosquitoes better than any in the world except the national collection at South Kensington.) The Department of Parasitology has been examining various aspects of trypanosome infections. The Ross Institute, under Professor G. Macdonald, is organizing systematic surveys of everyday medical happenings in rural Africa, where the foundations are being laid for accurate vital statistics in place of mere guesswork. In a different field, the Department of Biochemistry has been studying the metabolic products of micro-fungi; this is important work, because in addition to the proved clinical successes—penicillin, streptomycin, chloromycetin—a number of other mould

metabolic products have been shown to be potent antibacterial substances *in vitro*. These may never have much importance in clinical medicine, but they are of considerable potential importance in the synthesis of new chemical compounds of similar structural type. The report also contains accounts of the work of the Departments of Bacteriology, Human Nutrition, Applied Physiology, Public Health, and Medical Statistics.

At the annual meeting of the School held on March 23 under the chairmanship of Sir George Elliston, the Dean (Professor J. M. Mackintosh) described the development of the farm field station near St. Albans; this is administered as part of the School, and is used particularly for research in parasitology. Professor Macdonald reported that since the end of the war students from 34 countries have attended the School, and the proportion of overseas students is steadily rising. Latterly these have represented more than half the total of those attending the courses. Of 157 students from overseas who are mentioned as having completed their courses, 64 came from India; it is the present policy of the Indian Government to send as many medical students as possible abroad for a few years until an adequate nucleus of teaching staff is available in India itself. The number of Colonial medical officers attending courses is relatively small—the result of post-war disorganization—but there has been some improvement recently in this respect, and in the new course now assembled there are 20 officers of the service.

The School is proud of its fifty years' tradition, but is not spending an undue amount of time in looking back. No one can doubt that, inspired by the memory of Manson, it will advance from its present sound position to accomplish even greater things in the fifty years ahead.

ARTIFICIAL RESPIRATION AND THE CIRCULATION

The asphyxiated animal or man passes through the stages of unconsciousness, respiratory arrest, and finally cardiac arrest before death occurs. Hemingway and Neil[1] and Comroe and Dripps[2] have studied the effects of artificial respiration in the penultimate stage, when the heart is still beating, in animals and man respectively. At this time artificial respiration has a fair chance of success. Negovsky[3] treated wounded Russian soldiers in a state of clinical death by artificial respiration, and by the infusion into the brachial artery of 200–300 ml. of blood with added adrenaline, with the object of perfusing the coronary arteries and restarting the heart. He reported that out of 10 cases of clinical death so treated before operation five recovered completely without apparent cerebral damage. In such cases it is doubtful how far artificial respiration alone can move blood from the pulmonary capillaries where it is oxygenated, through the inactive heart, to the coronary and cerebral vessels where oxygen is needed. Volpitto and his colleagues[4] detected no significant changes in intraventricular pressures when dogs asphyxiated to the point of cardiac arrest were given artificial respiration. Thompson and his collaborators[5 6] have studied the movement of blood in dead dogs given artificial respiration with respiratory pumps. Tracer substances injected into the femoral artery and vein were widely disseminated through the body in the direction of normal circulation, but it took at least 10–20 minutes for fluorescein injected into the femoral vein to pass through the lungs and be detected in the mouth. Similarly, it took at least 10 minutes for blood oxygenated in the lungs to reach the femoral artery. Furthermore, unless the dogs were given heparin before asphyxiation intravascular clotting prevented even this meagre circulation. When it is uncertain whether the last faint beats of the heart have stopped in an asphyxiated, drowned, or electrocuted man, artificial respiration must be given at once by Schaefer's method, followed as soon as possible by Eve's rocking method, or, better still, by means of an artificial lung. In cases where the heart has finally stopped artificial respiration can circulate heparinized blood, but probably not at a rate sufficient to be useful in man.

[1] *British Medical Journal*, 1944, **1**, 833.
[2] *J. Amer. med. Ass.*, 1946, **130**, 381.
[3] *Nature*, 1946, **157**, 163.
[4] *J. Amer. med. Ass.*, 1944, **126**, 1066.
[5] *J. thorac. Surg.*, 1947, **16**, 710.
[6] Ibid., 1948, **17**, 323.

FOREIGN CORRESPONDING MEMBERS OF THE B.M.A.

In 1932, the year of the centenary of the Association, the decision was taken to elect a number of Foreign Corresponding Members of the Association. In that year 12 such members—all distinguished by eminent services rendered to medical science or to the medical profession—were elected. Other elections were made from time to time until 1939, but none during the war. Until the meeting of the Council last Wednesday there were only five Foreign Corresponding Members—namely, Professor Raffaele Bastianelli (Italy), Professor Jules Bordet (Belgium), Professor C. Gösta A. Forssell (Sweden), Professor Gregorio Marañón (Spain), and Dr. Claudius François Regaud (France).

On the recommendation of the Science Committee the Council of the B.M.A. has now decided to invite the following distinguished doctors to become Foreign Corresponding Members: Dr. Georg Domagk (Germany), pharmacologist and bacteriologist, and Nobel Prizewinner; Dr. Bernardo Alberto Houssay (Argentina), late Professor of Physiology, University of Buenos Aires, and Nobel Prizewinner; Professor Elliot Proctor Joslin (U.S.A.), Emeritus Professor of Medicine, Harvard Medical School; Professor Einar Key (Sweden), Emeritus Professor of Surgery, Caroline Medico-Surgical Institute, Stockholm; Professor René Leriche (France), Professor, Collège de France; Professor Einar Meulengracht (Denmark), Professor of Clinical Medicine, University of Copenhagen; Professor Adolf Meyer (U.S.A.), Professor of Psychiatry, Phipps Institute, Baltimore; Professor George Richards Minot (U.S.A.), Professor of Medicine, Harvard Medical School, and Nobel Prizewinner; Dr. Emil Novak (U.S.A.), Associate in Clinical Gynaecology, College of Physicians and Surgeons, Baltimore; Professor Alfred Newton Richards (U.S.A.), President, National Academy of Science, Washington; Dr. Francis Peyton Rous (U.S.A.), Pathologist, Rockefeller Institute; Dr. Arvid Johan Wallgren (Sweden), Chief Paediatrician, Children's Hospital, Gothenburg; and Professor Allen Oldfather Whipple (U.S.A.), Professor of Surgery, College of Physicians and Surgeons, Columbia University.

The B.M.A. considers it a privilege to honour these distinguished men in this way, and hopes that they will honour it by accepting the invitation to become Foreign Corresponding Members of the Association.

THE KING HONOURS SURGEON

The King knighted Professor J. R. Learmonth at Buckingham Palace on March 25, and invested him with the insignia of a Knight Commander of the Royal Victorian Order. Professor Learmonth performed the operation on his Majesty on March 12.

Honorary Surgeon to the King in Scotland since 1935, Professor Learmonth was appointed Surgeon to the King in February this year. He has been Professor of Surgery at Edinburgh University since 1939, and Regius Professor of Clinical Surgery since 1946.

FRACTURES OF THE NECK OF THE FEMUR

Up to the end of the war of 1914–18 transcervical fracture of the neck of the femur presented an insoluble problem. Non-union was accepted as inevitable. The credit for overcoming this defeatist attitude must be given to Whitman,[1] who showed that union could be obtained by applying the accepted principles of reduction and fixation. This involved encasing the patient in a long spica plaster-of-Paris splint; the treatment was tedious and uncomfortable, and stiffness of the hip and of the knee was a common sequel. Whitman himself never published his results, but it was generally assumed that union could be hoped for in 50% of patients. Löfberg,[2] following up 153 of his own patients treated by the Whitman method, reported union in 67%, whereas an American Commission[3] which reviewed a large number of cases treated in different clinics put the number of successful unions at 30%. Surgeons, now as optimistic as before they had been pessimistic, were not satisfied with these figures and searched for a more efficient treatment.

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Is operative treatment for a fracture of the neck of the femur an improvement on Whitman's abduction method? The answer is undoubtedly yes: the mortality is no greater, the end-result is better, and the discomforts of treatment are far less. It is reasonable to assume that two out of three patients with a transcervical fracture of the neck of the femur, treated by a competent surgeon by pinning, will be as good as they were before the accident, and one of four will be left a cripple.

ADVANCES IN MICROSCOPY

In addition to the electron microscope, which is still in the hands of the specialist, the phase-contrast microscope and ultra-violet and fluorescence microscopy are rapidly enlarging knowledge of the cell and of many other structures which come within the domain of the infinitely small. The existing knowledge of the microscopic structure of cells has in the past been derived almost exclusively from the study of fixed and stained material. With the phase-contrast microscope fresh material can be carefully examined. The development and application of the phase-contrast technique to the microscope is due in the first place to Zernicke,[1 2] and its subsequent improvement by Köhler and Loos[3] has placed a valuable tool in the hands of the biologist. Those who wish to acquire some knowledge of the principles and properties of the modern phase-contrast microscope should read Taylor's[4] description of it. The important property of phase contrast lies in the conversion of phase differences into amplitude differences; the eye is sensitive only to the latter. Thus phase-contrast microscopy will reveal structures which differ in refractive index from the surrounding medium by too small a degree to be made visible by other methods. At the same time, full apertures can be employed and the maximum resolving power of the objectives under the special conditions of illumination can be brought into use. As a result definition is very greatly improved, and this, coupled with the small depth of focus, provides a picture which in detail and contrast can be rivalled only by the best histological preparations. Furthermore, material can be prepared and examined much more rapidly than by histological procedures. In common with all other methods for the study of living material phase-contrast microscopy does not differentiate between structures which differ only in chemical nature, and to be fully effective it should be used in conjunction with histological methods. Phase-contrast microscopy is of the greatest value in the study of small living cells. Austin and Smiles,[5] for instance, have studied the fertilization and early development of the rat egg. The magnificent photomicrographs with which their paper is illustrated afford an opportunity for comparing the pictures obtained by direct illumination and by the phase-contrast technique.

Greater resolution and also information about the chemical constitution of the structures studied are obtained by the use of ultra-violet light as a source of illumination, since certain organic compounds possessing specific molecular configurations absorb ultra-violet radiations selectively. The first ultra-violet micrographic equipment was designed by von Rohr[6] and Köhler[7] in 1904, but the work of J. E. Barnard was responsible for the development of this type of microscope to its present high degree of efficiency; the apparatus and technique devised by him and Welch[8] for the study of bacteria and viruses have now largely been standardized for application to living cells. Ludford, Smiles, and Welch[9] have used this technique with success in the study of living malignant cells. As a result of their investigations Caspersson's[10] conception of a "cytoplasmic protein-forming system" has had to be modified, though there is no disagreement with the general conception of the relation of nucleic acids to protein synthesis. Cytoplasmic protein synthesis probably occurs in the peripheral parts of the cell and not in the immediate vicinity of the nucleus; the site of protein synthesis may very possibly be the mitochondrial-cytoplasmic interfaces.

Fluorescence microscopy also reveals differences in the chemical constitution of cell constituents. The idea of fluorescence microscopy was first suggested in 1911. When cells are treated with a fluorescent dye and are viewed in light of certain wavelengths various tissue structures give out secondary waves. Levaditi and his colleagues,[11] for instance, have shown that when ordinary sections from paraffin-embedded material are treated with a dye such as thioflavine S and exposed to wavelengths of light at 3,600 Å a maximum secondary transmission occurs when the wavelength equals 5,150 Å. Under these conditions photomicrographs can be taken on orthochromatic plates. Cytoplasmic inclusions caused by viruses can thus be recognized visually. For instance, the inclusions produced by rabies, vaccinia, and Borna disease fluoresce with an azure blue colour, the same tint as that given out by nucleoli and red cells. Cell protoplasm, nuclei, and collagen fibres, on the other hand, are golden yellow. When viewed by fluorescence microscopy the inclusions are oval or round, without visible structure. The elementary bodies of vaccinia, fowl pox, and lymphogranuloma venereum and the intranuclear inclusions produced by herpes all have a golden-yellow tint.

1 *Z. techn. Physik*, 1935, **16**, 454, 845.
2 *Phys. Z.*, 1935, **36**, 848.
3 *Naturwissenschaften*, 1941, **29**, 41.
4 *J.R. micr. Soc.*, 1946, **66**, 1.
5 Ibid., 1948, **68**, 13.
6 *Die Theorie der optischen Instrumente*, 1904, Vol. 1. Berlin.
7 *Z. wiss. Mikr.*, 1904, **21**, 129, 273.
8 *J.R. micr. Soc.*, 1936, **56**, 365.
9 Ibid., 1948, **68**, 1.
10 *Symp. Soc. exp. Biol.*, 1947, No. 1, p. 127.
11 *C.R. Acad. Sci., Paris*, 1948, **227**, 1061.

intra-cytoplasmic virus inclusions are thus almost certainly made up of elementary bodies surrounded by or embedded in material elaborated by the cell.

PRESSURE COOKING AND VITAMINS

While the pressure cooker is no novelty, having been available in various forms for at least 20 years, it has recently attracted attention as a solution to certain domestic difficulties caused by changed social and economic conditions. Pressure cooking has the great virtue of saving time, allowing a meal of meat, potatoes, and vegetables to be cooked in about 15 minutes.

The question may be asked whether the convenience of pressure cooking is outweighed by any ill-effects on the nutritive value of the food. In a letter to *The Times* some months ago C. V. Pink[1] suggested that at least half the vitamin B_1 in food would be destroyed. He considers, therefore, that pressure cookers should not be used for routine domestic cooking, but should be kept for occasions when a meal has to be produced quickly. The source of Pink's information, however, has been questioned by Professor J. Yudkin,[2] who in preliminary experiments has found smaller losses of vitamins B_1 and C in pressure cooking than in cooking in an ordinary saucepan.

In the early days of nutritional research the favourite method of obtaining a source of B_2 vitamins free from vitamin B_1 was to submit a yeast extract to vigorous treatment in an autoclave. There is no doubt, therefore, that a pressure cooker, if improperly used, could destroy vitamin B_1 and the equally unstable vitamin C, though there would be little or no loss of the fat-soluble vitamins A, D, and E, and some of the B vitamins. The danger of overcooking, particularly green vegetables, must be much greater with the pressure cooker than with the saucepan. There can be no question of judging the condition of the food by its appearance, aroma, or softness; the cook cannot see what is going on inside her apparatus, and carelessness in timing may ruin the food in a few minutes. To compensate for this practical disadvantage, which can be overcome by strictly keeping to the recommended times, two points in favour of the pressure cooker can be claimed on theoretical grounds. First the amount of water used in operating the cooker is very small; this should reduce losses of water-soluble vitamins and other nutrients which are lost by solution. Secondly, in ordinary cooking vitamin C is wasted if the temperature is raised slowly enough to allow enzymes to destroy the vitamin before they in turn are destroyed. The very rapid heating in pressure cooking should shorten the period during which enzymes could exert their action.

So far as can be judged from the limited evidence available, pressure cooking does not cause any greater losses of vitamins than good ordinary cooking. Thus domestic-science workers[3] in the U.S.A. found that in cooking cabbage, spinach, and peas the losses of vitamin B_1, C, and riboflavin were usually about the same with the pressure cooker as with the low-pressure steamer or with a closed saucepan containing a minimum quantity of water. Total immersion of the vegetables in an open saucepan invariably caused much greater losses. Elsewhere in this issue Miss G. M. Chappell and Miss A. M. Hamilton describe their investigation of the effect of pressure cooking upon the loss of vitamin C in vegetables. They found that on the average more vitamin C was retained in the vegetables cooked in a pressure cooker than in an ordinary saucepan by recommended methods. Their experiments also indicated that the vitamin B_1 content of pulses was better preserved by pressure cooking than by ordinary cooking. Further investigations will be required to obtain an answer to the question whether heating foods of all kinds for a short time in superheated steam is more or less harmful than a much longer period at the ordinary boiling-point of water. Fortunately past research has shown that the amounts of vitamins surviving in processed vegetables have been found to run roughly parallel to taste and culinary quality. If, therefore, users of pressure cookers succeed in preparing meals which can compare favourably in appearance and palatability with meals prepared by good ordinary cooking they need have little fear of defects in nutritive value. But if misuse of the pressure cooker gradually accustoms the taste to very soft potatoes and brown, pulpy vegetables, then the risk of malnutrition is a real one.

[1] *The Times*, Nov. 23, 1948.
[2] Ibid., Nov. 26, 1948.
[3] Sutherland, C. K., Halliday, F. G., and Hinman, W. F., *Food Res.*, 1947, 12, 496.

A TROPICAL MEDICINE JUBILEE

Last year saw the centenary of public health in this country. This year is the jubilee of two important events in the history of tropical medicine—the fiftieth anniversary of the opening of the Liverpool School of Tropical Medicine and of the foundation of the London School of Hygiene and Tropical Medicine. The development of the latter was referred to last week at the annual meeting of the court of governors. In 1899 Sir Patrick Manson opened the School of Tropical Medicine at the gates of the Albert Docks. In 1924, having moved in the meantime to Endsleigh Gardens, the School amalgamated with the new School of Hygiene, and five years later the London School of Hygiene and Tropical Medicine entered into possession of its fine building in Gower Street. Afterwards came the amalgamation with the Ross Institute.

The report for the school year 1947–8, which is just issued, is a lively and interesting document. Among other special features it contains a speech by the Poet Laureate in grateful memory of Ronald Ross—"We who knew him will never forget his greatness"—and a report, illustrated by some carefully drawn cartoons, on the progress of tropical medicine during the present century. For many years the Schools of Tropical Medicine were quite alone in facing a world of problems, but now rapidly expanding research schemes are undertaken by the Colonial Office, the Rockefeller Foundation, and the World Health Organization. These larger partners, however, must not be allowed to overshadow such research schemes as have their centre in Keppel Street. The School is ready to co-operate in the greater projects, but must zealously cultivate its own field and maintain its reputation for independent work.

A study of this jubilee report shows how varied is the work undertaken. In the Department of Entomology, for example, insecticides are being scientifically investigated, and a new type of study is concerned with the relation between biting insects and mites and the animals to which they transmit infection. (This department, by the way, possesses a collection of mosquitoes better than any in the world except the national collection at South Kensington.) The Department of Parasitology has been examining various aspects of trypanosome infections. The Ross Institute, under Professor G. Macdonald, is organizing systematic surveys of everyday medical happenings in rural Africa, where the foundations are being laid for accurate vital statistics in place of mere guesswork. In a different field the Department of Biochemistry has been studying the metabolic products of micro-fungi; this is important work because in addition to the proved clinical successes—penicillin, streptomycin, chloromycetin—a number of other moul-

metabolic products have been shown to be potent antibacterial substances *in vitro*. These may never have much importance in clinical medicine, but they are of considerable potential importance in the synthesis of new chemical compounds of similar structural type. The report also contains accounts of the work of the Departments of Bacteriology, Human Nutrition, Applied Physiology, Public Health, and Medical Statistics.

At the annual meeting of the School held on March 23 under the chairmanship of Sir George Elliston, the Dean (Professor J. M. Mackintosh) described the development of the farm field station near St. Albans; this is administered as part of the School, and is used particularly for research in parasitology. Professor Macdonald reported that since the end of the war students from 34 countries have attended the School, and the proportion of overseas students is steadily rising. Latterly these have represented more than half the total of those attending the courses. Of 157 students from overseas who are mentioned as having completed their courses, 64 came from India; it is the present policy of the Indian Government to send as many medical students as possible abroad for a few years until an adequate nucleus of teaching staff is available in India itself. The number of Colonial medical officers attending courses is relatively small—the result of post-war disorganization—but there has been some improvement recently in this respect, and in the new course now assembled there are 20 officers of the service.

The School is proud of its fifty years' tradition, but is not spending an undue amount of time in looking back. No one can doubt that, inspired by the memory of Manson, it will advance from its present sound position to accomplish even greater things in the fifty years ahead.

ARTIFICIAL RESPIRATION AND THE CIRCULATION

The asphyxiated animal or man passes through the stages of unconsciousness, respiratory arrest, and finally cardiac arrest before death occurs. Hemingway and Neil[1] and Comroe and Dripps[2] have studied the effects of artificial respiration in the penultimate stage, when the heart is still beating, in animals and man respectively. At this time artificial respiration has a fair chance of success. Negovsky[3] treated wounded Russian soldiers in a state of clinical death by artificial respiration, and by the infusion into the brachial artery of 200–300 ml. of blood with added adrenaline, with the object of perfusing the coronary arteries and restarting the heart. He reported that out of 10 cases of clinical death so treated before operation five recovered completely without apparent cerebral damage. In such cases it is doubtful how far artificial respiration alone can move blood from the pulmonary capillaries where it is oxygenated, through the inactive heart, to the coronary and cerebral vessels where oxygen is needed. Volpitto and his colleagues[4] detected no significant changes in intraventricular pressures when dogs asphyxiated to the point of cardiac arrest were given artificial respiration. Thompson and his collaborators[5 6] have studied the movement of blood in dead dogs given artificial respiration with respiratory pumps. Tracer substances injected into the femoral artery and vein were widely disseminated through the body in the direction of normal circulation, but it took at least 10–20 minutes for fluorescein injected into the femoral vein to pass through the lungs and be detected in the mouth. Similarly, it took at least 10 minutes for blood oxygenated in the lungs to reach the femoral artery. Furthermore, unless the dogs were given heparin before asphyxiation intravascular clotting prevented even this meagre circulation. When it is uncertain whether the last faint beats of the heart have stopped in an asphyxiated, drowned, or electrocuted man, artificial respiration must be given at once by Schaefer's method, followed as soon as possible by Eve's rocking method, or, better still, by means of an artificial lung. In cases where the heart has finally stopped artificial respiration can circulate heparinized blood, but probably not at a rate sufficient to be useful in man.

[1] *British Medical Journal*, 1944, **1**, 833.
[2] *J. Amer. med. Ass.*, 1946, **130**, 381.
[3] *Nature*, 1946, **157**, 163.
[4] *J. Amer. med. Ass.*, 1944, **128**, 1066.
[5] *J. thorac. Surg.*, 1947, **16**, 710.
[6] Ibid., 1948, **17**, 323.

FOREIGN CORRESPONDING MEMBERS OF THE B.M.A.

In 1932, the year of the centenary of the Association, the decision was taken to elect a number of Foreign Corresponding Members of the Association. In that year 12 such members—all distinguished by eminent services rendered to medical science or to the medical profession—were elected. Other elections were made from time to time until 1939, but none during the war. Until the meeting of the Council last Wednesday there were only five Foreign Corresponding Members—namely, Professor Raffaele Bastianelli (Italy), Professor Jules Bordet (Belgium), Professor C. Gösta A. Forssell (Sweden), Professor Gregorio Marañón (Spain), and Dr. Claudius François Regaud (France).

On the recommendation of the Science Committee the Council of the B.M.A. has now decided to invite the following distinguished doctors to become Foreign Corresponding Members: Dr. Georg Domagk (Germany), pharmacologist and bacteriologist, and Nobel Prizewinner; Dr. Bernardo Alberto Houssay (Argentina), late Professor of Physiology, University of Buenos Aires, and Nobel Prizewinner; Professor Elliot Proctor Joslin (U.S.A.), Emeritus Professor of Medicine, Harvard Medical School; Professor Einar Key (Sweden), Emeritus Professor of Surgery, Caroline Medico-Surgical Institute, Stockholm; Professor René Leriche (France), Professor, Collège de France; Professor Einar Meulengracht (Denmark), Professor of Clinical Medicine, University of Copenhagen; Professor Adolf Meyer (U.S.A.), Professor of Psychiatry, Phipps Institute, Baltimore; Professor George Richards Minot (U.S.A.), Professor of Medicine, Harvard Medical School, and Nobel Prizewinner; Dr. Emil Novak (U.S.A.), Associate in Clinical Gynaecology, College of Physicians and Surgeons, Baltimore; Professor Alfred Newton Richards (U.S.A.), President, National Academy of Science, Washington; Dr. Francis Peyton Rous (U.S.A.), Pathologist, Rockefeller Institute; Dr. Arvid Johan Wallgren (Sweden), Chief Paediatrician, Children's Hospital, Gothenburg; and Professor Allen Oldfather Whipple (U.S.A.), Professor of Surgery, College of Physicians and Surgeons, Columbia University.

The B.M.A. considers it a privilege to honour these distinguished men in this way, and hopes that they will honour it by accepting the invitation to become Foreign Corresponding Members of the Association.

THE KING HONOURS SURGEON

The King knighted Professor J. R. Learmonth at Buckingham Palace on March 25, and invested him with the insignia of a Knight Commander of the Royal Victorian Order. Professor Learmonth performed the operation on his Majesty on March 12.

Honorary Surgeon to the King in Scotland since 1935, Professor Learmonth was appointed Surgeon to the King in February this year. He has been Professor of Surgery at Edinburgh University since 1939, and Regius Professor of Clinical Surgery since 1946.

NATIONAL HEALTH SERVICE EXPENDITURE

ESTIMATES FOR 1949–50

The Civil Estimates for 1949–50, presented to the House of Commons on March 23, show that in the coming year the total cost of the National Health Service in England and Wales will be £228,424,600. This is made up as follows:

	1949–50	1948–9	Increase
	£	£	£
Central Council, etc.	16,000	10,000	6,000
Hospital, specialist, and ancillary services	169,648,500	123,479,000	46,169,500
Services provided by local health authorities	13,275,000	8,758,000	4,517,000
General medical and dental services, pharmaceutical services, and supplementary ophthalmic services	95,661,800	75,340,500	20,321,300
Other services	18,597,000	27,518,542	—
WALES			
Hospital, specialist, and ancillary services	7,882,500	6,118,500	1,764,000
Services provided by local health authorities	750,000	525,000	225,000
General medical and dental services, pharmaceutical services, and supplementary ophthalmic services	6,730,800	4,981,000	1,749,800
Other services	108,000	866,000	—
Gross total	£312,669,600	£247,596,542	£74,752,600
Deduct—			
Appropriations in aid	84,245,000	62,165,400	—
Net total	£228,424,600	£185,431,142	£74,752,600
		Net increase	£42,993,458

The Central Health Services Council and Standing Advisory Committees will spend £11,000 on salaries and wages and £4,000 on payments to members for loss of remunerative time, travelling, and subsistence.

Hospital, Specialist, and Ancillary Services

Here there are increases in every item, though it must be recalled that in 1948–9 the Service was operating only for nine months. The details are as follows:

	1949–50	1948–9
	£	£
ADVANCES TO REGIONAL HOSPITAL BOARDS:		
(*a*) Capital expenditure	7,000,000	5,251,000
(*b*) Maintenance and running costs, including specialist services	133,000,000	98,688,000
Total	£140,000,000	£103,939,000
ADVANCES TO BOARDS OF GOVERNORS OF TEACHING HOSPITALS:		
(*a*) Capital expenditure	1,935,000	1,656,000
(*b*) Maintenance and running costs, including specialist services	22,000,000	16,505,000
Total	£23,935,000	£18,161,000
CAPITAL EXPENDITURE BY THE MINISTER IN THE ACQUISITION OF LAND, HOSPITALS, AND EQUIPMENT:		
(*a*) Acquisition of land	3,000,000	250,000
(*b*) Acquisition of hospitals	100	—
(*c*) Acquisition of hospital equipment, etc.	100	—
Total	£3,000,200	£250,000
PAYMENTS TO THE MINISTRY OF PENSIONS:		
(*a*) Medical treatment	5,000	19,000
(*b*) Surgical appliances—supply, renewal, and repair	1,875,000	473,000
(*c*) Travelling and other incidental expenses	22,000	8,000
Total	£1,902,000	£500,000
EXPENSES OF THE MINISTER IN CONNEXION WITH RESEARCH:		
(*a*) Special inquiries into diseases	15,600	8,260
(*b*) Other services	5,700	5,740
Total	£21,300	£14,000
BACTERIOLOGICAL SERVICE, ETC.:		
(*a*) Expenses of public health laboratories	730,000	557,000
(*b*) Payment to the Lister Institute for the production of lymph	18,000	17,500
(*c*) Cost of toxoids, etc., supplied for immunization purposes	22,000	31,000
(*d*) Other services	20,000	9,500
Total	£790,000	£615,000

General Medical Services

The expenditure under this heading is estimated as follows:

(a) Expenses of Executive Councils

	1949–50	1948–9
	£	£
ADMINISTRATION:		
(*a*) Salaries, wages, etc.	1,350,000	1,026,000
(*b*) Payments to members for loss of remunerative time, and travelling and subsistence expenses of members and staff	14,000	15,000
(*c*) Incidental expenses	546,000	460,000
Total	£1,910,000	£1,501,000
GENERAL MEDICAL SERVICES: Payments under arrangements made with medical practitioners	£37,825,000	£28,000,000
PHARMACEUTICAL SERVICES: Payments under arrangements made for the supply of drugs, medicines, and appliances	£17,530,000	£15,000,000
GENERAL DENTAL SERVICES: Payments under arrangements made with dental practitioners	£26,343,000	£17,750,000
SUPPLEMENTARY OPHTHALMIC SERVICES: Payments under arrangements made for the testing of sight and the supply of optical appliances	£11,716,000	£12,900,000
TRANSFERRED LIABILITIES: Payments in respect of liabilities transferred to executive councils from insurance committees	£1,000	£5,000

(b) Other Expenses

MEDICAL PRACTICES COMMITTEE:		
(*a*) Salaries, wages, etc., including remuneration of members	6,000	6,000
(*b*) Payments to members and staff for travelling and subsistence expenses	1,500	1,000
(*c*) Incidental expenses	500	250
Total	£8,000	£7,250

In this same section £320,000 is provided for the Denta Estimates Board, as against £171,000: and the Tribunal set up under Section 42 of the Act will cost £300, as against £250. Or refresher courses £8,500 will be spent, as against £6,000; £3,00 will be paid to the universities for the provision of courses, an £5,500 will be needed for travelling and subsistence allowance

In 1948–9 a sum of £4,250,000 was set aside for compens tion for loss of the right to sell medical practices. The corre sponding allocation for 1949–50 will be £5,000,000, and the is also provided for the first time the sum of £2,250,000 to pa the interest on compensation which must remain outstandin until the retirement or death of the practitioner.

The cost of the superannuation scheme will be £1,955,000, against £1,360,000, and £150,000 is set aside for compensatio for loss of office under Section 68 of the Act, as against £50,00 in the first nine months of the Service. The estimated cost o medical supplies is divided as follows:

	1949–50	1948–9
	£	£
CENTRAL PURCHASE OF MEDICAL SUPPLIES, STORES, AND EQUIPMENT:		
(*a*) General medical and surgical stores and appliances	2,540,000	2,200,000
(*b*) *X*-ray equipment	1,890,000	510,000
(*c*) Purchase of streptomycin, etc.	490,000	295,000
(*d*) Government hearing-aids	1,625,000	200,000
(*e*) Mass radiography units and vans	200,000	127,000
(*f*) Miscellaneous	255,000	168,000
Total	£7,000,000	£3,500,000

Liabilities transferred to the Minister under Sections 6 and 69 of the Act totalled £17,750,000 in 1948–9. The corresponding figure for 1949–50 is estimated at only £1,751,000. Among other items budgeted for are the expenses of Rampton and Moss Side Hospitals for Mental Defectives (£282,575); the Broadmoor Institution (£168,425); and miscellaneous committee expenses and contributions to the National Association for Mental Health and the Central Council for Health Education, which will account for only £40,000 as against £72,000 for 1948–9.

Wales

A separate estimate for Wales shows that advances to regional hospital boards will total £7,180,000, as against £5,645,000. There is also an increase in the advances to boards

of governors of teaching hospitals from £468,500 in 1948–9 to £685,000. The expenses of the Minister in connexion with research on pneumoconiosis are put at £500 for 1949–50 as against £3,000 in 1948–9. Other research services are again estimated at £1,000. The services provided by local authorities will cost £750,000 as against £525,000.

(a) Expenses of Executive Councils

	1949–50	1948–9
ADMINISTRATION:	£	£
(a) Salaries, wages, etc.	82,000	67,000
(b) Payments to members for loss of remunerative time, and travelling and subsistence expenses of members and staff	2,000	2,000
(c) Incidental expenses	35,000	36,000
Total	£119,000	£105,000
GENERAL MEDICAL SERVICES: Payments under arrangements made with medical practitioners	£2,575,000	£1,800,000
PHARMACEUTICAL SERVICES: Payments under arrangements made for the supply of drugs, medicines, and appliances	£1,470,000	£1,225,000
GENERAL DENTAL SERVICES: Payments under arrangements made with dental practitioners	£1,861,000	£1,250,000
SUPPLEMENTARY OPHTHALMIC SERVICES: Payments under arrangements made for the testing of sight and the supply of optical appliances	£704,000	£600,000
TRANSFERRED LIABILITIES: Payments in respect of liabilities transferred to executive councils from insurance committees	£100	£1,000

(b) Other Expenses

REFRESHER COURSES:		
(a) Payments to universities, etc., for the provision of courses	350	—
(b) Travelling, subsistence, and other expenses of persons attending courses	1,350	—
Total	£1,700	—
LIABILITIES TRANSFERRED TO THE MINISTER:		
(a) Liabilities transferred in respect of voluntary hospitals	10	400,000
(b) Liabilities transferred in respect of local authority hospitals	106,990	455,000
Total	£107,000	£855,000

Scotland

The National Health Service in Scotland will cost £31,303,000 for 1949–50, as against £22,907,000 in 1948–9. This is made up as follows:

	1949–50	1948–9	Increase
	£	£	£
Scottish Health Services Council, etc.	1,000	1,000	—
Hospital, specialist, and ancillary services	24,471,000	15,480,000	8,991,000
Services provided by local health authorities	1,100,000	950,000	150,000
General medical and dental services, pharmaceutical services, and supplementary ophthalmic services	12,553,000	10,070,000	2,483,000
Other services	1,530,000	1,807,000	—
Gross total	£39,655,000	£28,308,000	£11,624,000
Deduct— Appropriations in aid	8,352,000	5,401,000	—
Net total	£31,303,000	£22,907,000	£11,624,000
		Net increase	£8,396,000

Advances to regional hospital boards will total £23,200,000 (£15,000,000 in 1948–9); expenditure by the Secretary of State on health centres £20,000; on research £20,000; on bacteriological services £90,000; and on blood transfusion services £80,000. Grants to local health authorities will total £1,100,000 (as against £950,000).

The estimates for general medical services are made up as follows:

	1949–50	1948–9	Increase
(a) Expenses of Executive Councils	£	£	£
Administration	320,000	250,000	70,000
General medical services	5,400,000	4,000,000	1,400,000
General dental services	2,700,000	2,800,000	—
Pharmaceutical services	1,800,000	1,490,000	310,000
Supplementary ophthalmic services	2,250,000	1,470,000	780,000
Transferred liabilities	11,000	11,000	—
(b) Other Expenses			
Expenses of Scottish Medical Practices Committee	4,000	2,000	2,000
Expenses of Scottish Dental Estimates Board	63,000	40,000	23,000
Expenses of the tribunal under Section 43 of the Act	1,000	1,000	—
Expenses of refresher courses	4,000	6,000	—
Total	£12,553,000	£10,070,000	£2,585,000

The amount set aside for compensation is £575,000 (as against £300,000); for superannuation £140,000 (£75,000); compensation for loss of office £1,000 (£30,000); central purchase of stores and equipment £370,000 (£100,000).

Taken as a whole the Civil Estimates for 1949–50 make it clear that the total cost in the coming year of the National Health Service, National Insurance, and National Assistapce will be £555,358,000. In the present financial year, during which these social services will have operated only for nine months, the total cost will be £449,980,000.

If the rate of expenditure in the first nine months had been continued, the annual cost would have been about £600,000,000. These estimates for 1949–50, which are about £45,000,000 below that figure, show that the rate of expenditure is expected to fall.

PROGUANIL IN PROPHYLAXIS AND TREATMENT

COLONIAL MEDICAL RESEARCH COMMITTEE'S RECOMMENDATIONS

The following recommendations on the use of proguanil ("paludrine") in the prophylaxis and treatment of malaria, and suggestions for trial, are issued by the Colonial Office and the Medical Research Council on the advice of the Colonial Medical Research Committee. It should be clearly appreciated that the recommendations are tentative on the basis of present knowledge and that they are subject to review in the light of future experience and experiment.

Prophylactic Use

The dose recommended for suppression of malaria of all types in endemic areas is 100 mg. daily. For children the following dosage is advised: from birth to 5 years—25 mg. daily; from 6 to 12 years—50 mg. daily. When a daily dose is not practicable one dose of 300 mg. should be taken on the same day each week; dosage for children should be in the proportion indicated.

In the case of persons, other than the indigenous inhabitants, who have been resident in an endemic area for some time, or who have been otherwise already exposed to malarial infection, a full therapeutic course (see 1 (*a*) below) should be taken before entering on the suppressive regimen.

1. P. Falciparum (Malignant Tertian) Infections; Mixed Infections; Undiagnosed Type Infections

(*a*) *Treatment of Non-immunes.*—Proguanil alone cannot be relied upon to effect radical cure in all cases, and the clinical response with this drug unaided is also somewhat slow. It has been shown, however, that these disadvantages may be overcome by reinforcement with mepacrine on the first day of treatment. The following combined course is recommended *for trial*: 300 mg. proguanil twice daily for 10 days reinforced on the first day of treatment with three doses of 300 mg. mepacrine, and followed by 100 mg. proguanil daily for

six weeks. (Persons continuing to live in an endemic area should continue their suppressive regimen.)

(*b*) *Treatment of Clinical Attack in Semi-immune Subjects such as Labour Forces and Rural Populations in Endemic Areas.*—A single dose of 300 mg. proguanil will usually suffice to produce clinical cure. Relapses can be treated similarly as and when they arise. Serious cases should be given emergency treatment (see below).

(*c*) *Treatment of Malarial "Emergencies."*—For treatment of conditions such as cerebral or algid malaria and where for any other reason the patient is unable to take drugs by mouth, immediate intramuscular mepacrine or intravenous quinine therapy should be employed.

2. P. Vivax (Benign Tertian) Infections

(*a*) *With the Object of Radical Cure.*—The course advised for adults is 100 mg. proguanil plus 10 mg. pamaquin base (or a corresponding dose of one of the other 8-amino-quinoline derivatives) three times daily for 10 days. The dose for children should be proportionate. Pamaquin should not be given unless the patient can be kept in bed under medical supervision throughout the course; this is particularly important in the case of children. When the patient cannot be kept in bed the alternative course recommended is 100 mg. proguanil three times daily for 10 days followed by a single dose of 300 mg. proguanil on the same day each week for a year.

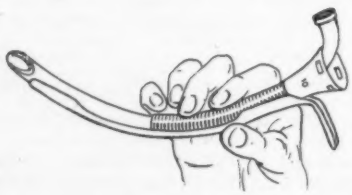
(*b*) *Treatment of the Clinical Attack in Semi-immunes.*—As for M.T. malaria.

Unless otherwise stated, the dosage mentioned is that for adults. In recommending the use of a single dose of 300 mg. proguanil for the treatment of the febrile attack in semi-immunes and a weekly dose of 300 mg. for suppressive purposes, the advantages of these procedures are emphasized as (*a*) bringing an effective antimalarial drug within the economic capacity of village and rural populations of endemic areas of malaria and (*b*) providing a method of prophylaxis easy of administration.

Preparations and Appliances

ORO-TRACHEAL TUBE INTRODUCER

Dr. J. G. BOURNE, honorary anaesthetist, St. Thomas's Hospital, writes: In a previous article (*British Medical Journal*, 1947, **2**, 654) I described a "spring" made in two sizes, Nos. 10 and 8, for use with oro-tracheal tubes, and added: "The Macintosh laryngoscope is preferred to other models. It sometimes happens that the Magill tube is deflected towards the oesophagus at a tangent to its curved blade. To overcome this little difficulty various types of simple introducers have



been used to direct the tip of the tube into the glottis." Illustrated here is the introducer which I have found most satisfactory. It is withdrawn directly the tip of the tube has passed between the cords.

I would like to make two further observations with regard to the use of these "springs." First, when correctly placed in position the tube should lie well to one side or the other of the tongue. If it is left over the dorsum it tends to be extruded from the mouth. Secondly, if a tube and a connecting-piece of suitable fit are chosen they can be firmly locked within the "spring" by being pulled down into it from the bevelled end of the tube. If this fails they can be fixed with tape before tying this round the patient's neck. These "springs" and introducer are now obtainable from Messrs. A. Charles King, 27, Devonshire Street, London, W.1.

I am indebted to Miss J. Dewe, of St. Thomas's Hospital, for the drawings in this and in the original article.

Reports of Societies

SPECIALIZATION—ITS VALUE AND ABUSE

A meeting of the Section of Medicine of the Royal Society of Medicine on March 22 was devoted to a discussion on specialization. Sir ADOLPHE ABRAHAMS presided.

Sir ROBERT YOUNG recalled that when he himself started his clinical work as a student the two senior surgeons at his hospital both also practised ophthalmology, the throat surgeon was lecturer on anatomy, and the physician to the skin department was also assistant physician to the hospital. His own first reaction to the starting of special departments was antagonistic, but he soon realized that special departments were necessary and helpful and to the public advantage. The chief factor in promoting specialization in medicine had been the rapid development of instruments and instrumental methods. The clinical laboratory was a comparatively recent development, but it was difficult now to realize to what extent physicians of a former day had to rely upon their senses. One of the unfortunate results of specialization had been that they were liable to cut short their direct observation of the patient and proceed at once to the instrumental or radiological aid.

The only abuses of specialization that he could see were in employment as a cloak for the crank and a spotlight for the quack, but there were many misuses. An important one was the direct approach by the patient or his friends to the specialist, and in some cases the ready acquiescence of the specialist in such approach, without the knowledge or approval of the general practitioner. One of the unfortunate results of specialization was the passing of the general physician. The student at all stages of the curriculum was now taught by specialists, the best of whom were enthusiasts. The old physician, however, should not be pushed aside. The time taken in eliciting the history of the patient and making the routine examination was by no means time wasted. It might save a great deal. He was glad that in most hospitals there were still some general physicians.

At the present time the general practitioner was caught in a vortex of forms, certificates, and reports. When he was free from all these he would wish to be the trusted, unhurried, unharried adviser of his patient. Sir Robert Young hoped that some day a Ministry of Health would issue a special instruction to medical schools asking them to revive, restore, and reintroduce doctors of the old type, who were interested in the general make-up of their patients and knew that what they had to deal with was not the mere dysfunction of an organ but a suffering human being.

Integration Needed

Mr. A. DICKSON WRIGHT considered that one result of the National Health Service would be a temporary eclipse of the more general aspects of medicine and surgery. In former days they could recall many men who, after establishing themselves in the front rank as general physicians, came to devote themselves to some special aspect; Sir William Gowers, Sir John Rose Bradford, and Sir William Broadbent were examples. Since then specialization had developed in curious ways and unevenly in different countries. In America it had gone ahead and had been to some extent overdone. In France it had lagged behind, and there the general surgeons did gynaecological operations. The need was to integrate the specialist system with a very good general practitioner system. In America the patients rambled around among the specialties according to their whim or the advice of the hall-porter. Moreover, men in general medicine were almost forced to take up a specialty or lose in the race for places. If they continued their general medicine alongside their specialty they might be regarded as second-rate by the general public. In the teaching hospitals the ultra-specialist was apt to feel that his work was too deep or advanced for the students, and the students, already overburdened, were inclined to think the same, and so the narrow specialist escaped his teaching duties, leaving more and more to the general physician and surgeon. But it was possible that as specialist techniques became simplified a number of specialists would come back into the general field again.

Some specialists, Mr. Dickson Wright continued, became bored with the monotony and narrowness of their specialty and extended their work into other fields. The neurologist would interest himself in the female pelvic floor, and work in the territory of the gynaecologist; the gynaecologist would start to work on the rectum, owing to the proximity of the parts, or he would look on the breast as his domain, the breast being controlled by the ovaries. The thoracic surgeon would concern himself with the alimentary tract and the sympathetic chains and the vagus nerve which passed through his territory. The orthopaedic surgeon was perhaps the worst offender of all in this respect. An opposite abuse was for the specialist to become narrower and narrower. Specialties were developing for cavities, for organs, for systems, for ages, for techniques, even for ways of thinking. He instanced the treatment of cancer. The cancer specialist, allied with the statistician, might be ready to take control of any organ of the body in which cancer might appear. Specialties in cancer, in diabetes, in rheumatism, in tuberculosis were open to serious criticism.

Another development of specialization was the complicated approach to diagnosis. The specialist surrounded diagnosis with a great deal of investigation. The man who used the gastroscope was assumed to be ahead of the man who did not. The ultra-specialists were unwilling to accept simple explanations. There was a tendency to over-elaborate, especially in the matter of diagnosis, and to wrap a case up in a large amount of diagnostic ritual which created its own impression on the patient and also gave the specialist's colleagues the feeling that they could not carry on a specialty unless they did all this too. A great many of these evils would disappear if the entrance upon specialism were a little longer delayed. The man who had a good grounding in general medicine and surgery and then quietly went into specialism would serve the public better than the man who became a specialist almost from his first M.B.

The PRESIDENT here remarked that the public was very largely to blame for the abuses of specialization. With the development of instruments it was more or less inevitable that they should expect a specialist for every symptom. The remedy was the proper recognition of the general practitioner and the general physician.

Specialization Justified

Sir HENRY COHEN said that there were some branches of medicine in which a degree of specialization was not only advisable but necessary. In research, the narrower the field the more deeply could one dig, and there was no doubt that to-day a great number of advances in medicine came from digging very deeply, with all the instruments available, in a relatively narrow field. Therefore some degree of specialization in research, whether clinical or laboratory or a combination of both, might be regarded as justifiable. But while there was some justification for a man pursuing research in renal disease there could be no justification for a man confining his practice of medicine to the kidneys.

He thought it unwise that specialization should enter at all into undergraduate, as opposed to postgraduate, teaching. Specialization had led to the provision of clinical material in the undergraduate teaching hospitals which was quite unsuitable for the undergraduate. It had led to the population of undergraduate teaching hospitals being entirely unsuitable for undergraduate teaching. What was needed was that the teacher of undergraduates should be concerned to inculcate a philosophy of medicine.

When it came to practice, he believed that many of the difficulties arose partly from nomenclature and partly because they had not pictured to themselves the kind of case in which specialists played a part. The general practitioner should have been so trained that he had a large outlook in medicine. He might need for the purpose of diagnosis, for example, a radiologist, but he should be quite competent to understand the radiologist's films and his report. He might need a pathologist or other specialists because they practised a special branch which was largely concerned at this stage of the case with diagnosis. If, again, his patient needed some special treatment he might have to refer him to a surgeon or some specialist surgeon. Apart from all this, however, there must be patients about whom the general practitioner was uncertain, and there should be a group of people to whom he could refer these difficult problems—namely, the consultants. He likened the consultant to the conductor of an orchestra, one who perhaps could not play the violin as well as his first violinist, or could not play the 'cello at all, but who knew how to get the necessary reaction and response from a number of people. The consultant himself might require certain information for which he would have to refer to a surgeon, a neurosurgeon, a thoracic surgeon, or whomsoever it might be, but there should be general physicians trained as such, and afterwards perhaps some of them might, because of their interest or opportunity, take up cardiology or urology or some other special branch.

One of the dangers of specialization, in Sir Henry Cohen's opinion, was that often the specialist on examining the patient referred to him discovered something in his own department which had no relation to the patient's complaint but with which he persisted in dealing. Focal sepsis was a case in point. He had often seen gallstones removed from a patient whose complaint in fact was due to other causes. It was true that there were gallstones, but a proper history and examination would have shown the cause of the symptoms to lie elsewhere. The surgeon could become so expert in some technical procedures that he took a pride in their performance. But the feasibility of an operation or the completeness with which it could be done was not the best indication for resorting to it. He agreed that there were specialties, both in the field of diagnosis and of treatment, which required such perfection of technique as to justify them. But it must always be remembered that a man was more than the sum of his parts. The gastric system could not be isolated from the nervous system, or the respiratory from the renal system. Jowett said of logic that it was not a science but a trick, and much the same was true of surgery. It was important, more particularly in some special branches of surgery, that there should be competence in technique, both diagnostic and therapeutic, which competence could come only with specialization, and therefore specialization was clearly necessary. But there was no justification for a specialization in which the sole basis of the specialty was an instrument.

Back to the General Physician

Dr. MAURICE DAVIDSON remarked that it used to be said, "If you want pathology, go to the Germans; if you want surgery, go to the French; but if you want to get well, go to the British." There was a time when that was true, and he was sufficient of a "reactionary" to wish that that time would come back. One of the outstanding faults about medical teaching was that it had become divorced from the principle of general education which used to be so outstanding a feature of the medical student's curriculum. During the last twenty-five years there had been an increasing tendency on the part of medical committees of teaching hospitals to appoint people by reason of their prominence in some comparatively narrow field. The question would be asked of a candidate, "What has he done?"—meaning, "What contribution has he made to elaborate scientific literature?"—rather than, "What experience has he had from the wider point of view? What are his abilities for summing up and dealing with the whole personality of the sick man?"

Dr. S. L. SIMPSON said that there were large numbers of good specialists practising in all branches of medicine who had done general medicine and pathology for a number of years. The teams which operated, for example, at Queen Square or Great Ormond Street were without doubt supreme, and were leaders in their respective fields of nervous diseases and children's diseases. The important thing, surely, was neither specialization nor general medicine, but sound judgment in both. He agreed that no man should be a specialist who had not a general training. Specialization impoverished general medicine and surgery, and some arrangement should be made whereby, while they had specialists in general hospitals, this impoverishment was avoided.

Dr. RICHARD ASHER said that one of the dangers of specialization was that specialists were apt to frighten off the "general" man, making him feel that certain parts of medicine lay within a prohibited zone. Some psychiatrists, for example, made general practitioners feel that for them to enter upon their patient's worries and anxieties was a blundering invasion. As an example of ultra-specialism, he mentioned that a patient was sent to an ophthalmologist, who returned the case saying

that the man had retinitis pigmentosa and that this might indicate the Laurence-Moon-Biedl syndrome, and he therefore suggested that the patient should be examined to discover whether he had polydactyly.

In reply to Dr. Horace Joules and others, Sir HENRY COHEN said that he had no use for the isolated special hospital except where it might be pursuing research or a form of treatment which required special skill. Great as had been the history of Queen Square and Great Ormond Street—two hospitals mentioned in the discussion—he believed it would have been greater had they been part of general hospitals with access to the general outlook in medicine.

ANTIHISTAMINE DRUGS

A meeting of the Section of Experimental Medicine of the Royal Society of Medicine on March 8 was devoted to a discussion on antihistamine drugs. Dr. H. P. HIMSWORTH presided.

Professor W. A. BAIN, of Leeds University, brought forward a quantitative study, by himself and his co-workers, of the action of histamine antagonists in man. From a pharmacological point of view, he said, this work represented an attempt to apply to man quantitative methods which had been applied with success to animals and animal tissues. The intradermal reaction to varying doses of histamine had been determined by the measurement of weal and flare areas on the skin of the forearm, and the extent to which such reactions were modified by histamine antagonists had been determined. It was relatively easy to devise means of obtaining quantitative information about the relative weight-for-weight potencies of the different drugs, the duration of their action, and their therapeutic efficacy. What could not be precisely dealt with quantitatively were the side actions. A group of subjects were given different doses of histamine antagonists—"phenergan," "anthisan," "antistin"—and the weal response computed. It was then possible thus to construct dose-response curves for the different drugs and obtain a measure of their relative weight-for-weight potencies.

Phenergan was found to have the most powerful action on the intradermal weal response, being 7 times more potent than anthisan and 14 times more potent than antistin. It took much longer than the others to establish its full action, reaching its maximum in three hours. The mean time taken by phenergan to fall from maximum to half the maximum action had also been measured; it was 1,170 minutes. The corresponding time with anthisan was 310 minutes, and with antistin 210. Thus phenergan stood out as the most powerful and the longest-acting drug. Because of the lengthy action of phenergan it seemed that it might be a good plan to give this drug, not as customarily three times a day, but once in the twenty-four hours, and that at night, so that the sleepiness it produced would pass unnoticed, while its action might be expected to continue through the following day. On comparing the nightly dose of phenergan required to clear a chronic urticaria with the daily dose of anthisan needed for the same result it was found that on the average only one-fourteenth of the amount of phenergan was necessary—in other words, a nightly dose of 25 mg. of phenergan was equivalent to a daily dose (split up into three or four administrations) of 350 mg. of anthisan. Of the 20 subjects on whom the experiment was tried only one preferred anthisan, 5 had no preference, and 14 preferred phenergan, no doubt because of the relative absence of side effects. The question was raised whether in chronic urticaria the antihistamines were perhaps exhibiting two modalities of action—(1) an increase in capillary permeability, and (2) interference with the liberation of histamine from the tissues.

Types of Asthma

Dr. H. SCHILD pointed out that the antihistamines did not affect equally the whole action of histamine. The drugs were not necessarily specific; many drug actions overlapped. Most antihistamine drugs were specific in small doses, but tended to have a more widespread action in higher concentrations. When antihistamines were discovered it was thought that it would be possible to distinguish between histamine-asthma and asthmas of other types, but in fact it had not turned out in that way. Antihistamines had proved useful, but not exactly in the way expected. As chronic asthma could not be induced in animals it was the more important that the pharmacologist and clinician should work together in the study of these phenomena in man.

Dr. RANYARD WEST said that up to date it could not be stated that antihistamine drugs abolished or prevented the bronchospasm of asthma under any well-controlled conditions. But apart from simple asthma there was another condition of bronchospasm in which histamine liberation occurred. This was curare-bronchospasm, first described in 1935 as a regularly occurring complicating action of crude curare. He described the action of antihistamine drugs in this condition.

Dr. H. G. J. HERXHEIMER said that not all subjects were sensitive to antihistamines, and some were sensitive only to one or two of the drugs. The dosage would be different in every patient and had to be worked out with great care. If these drugs were given to sensitive patients and in the right doses they were most beneficial, but in severe bronchial constriction in an acute attack of asthma no action of the antihistamines would serve. It was only in mild degrees of the condition that the antihistamine was protective. It was effective only in mild asthmatic states.

Nova et Vetera

HISTORY OF CARDIOLOGY

A History of the Heart and Circulation. By F. A. Willius, M.D., M.S. in Med., and T. J. Dry, M.A., M.B., Ch.B., M.S. in Med. (Pp. 456; illustrated. £2.) Philadelphia and London: W. B. Saunders Company. 1948.

This book is full of interesting information. In a sense it is a companion volume to that attractive book *Cardiac Classics* which Willius and Keys have compiled. The authors have approached the subject from three points of view. The writing of medical history has often been unsatisfactory. It so easily becomes a dull, disconnected catalogue of biography. The most interesting method is to trace the development of ideas or knowledge in some special subject. The authors first survey various epochs, beginning with the remote past, continuing with the Mediaeval and Renaissance eras, and ending with the first quarter of the present century. The second part comprises selected biographies in which the lives and writings of the most eminent workers in the subject are described. Finally, for reference, there is a selection of various topics with a chronological account of the various steps of advance that have been made in each. These three approaches lead to some overlapping, but that does not really matter; in some ways it is an advantage. There are many good illustrations, mainly portraits. The authors have found room for quite long quotations from original descriptions. The index is in two parts—subjects in one and personal names in the other.

There could never be complete agreement on the selection of names. On this side of the Atlantic we have known too little about some of them. Perhaps the chapter on the theological activities of Servetus might have been shorter and so less dull. The English is often heavy and lacks charm and vigour, so that the book is not easily readable. The author might have said more about the early work on intermittent claudication. The acknowledgment for the portrait of Floyer on p. 78, which was found by Professor Gunn in a book in the Bodleian Library, is really due to the *Medical Press and Circular*, which published it first in about 1934. Too little is said of Floyer's books. Is it correct to say that Trousseau referred to fibrosis of the lung as "Corrigan's disease" (p. 123)? In his 89th lecture he refers to aortic reflux in this way, which is still the practice in France, just as they still call the syphilitic lesion "maladie de Hodgson" (but not "d'Hodgson," as is given in this book on p. 114). At the foot of p. 364 there is a slip which makes Sir Thomas Lewis "K.T."

The study of the origins of our knowledge is only beginning to assume a due proportion. This book will be of value to anyone interested in cardiology and particularly to anyone engaged in teaching. It is a useful addition to that excellent little book on the growth of our knowledge of heart disease that R. O. Moon wrote twenty years ago, and to the Harveian lecture by Rolleston in 1928, which was an admirable account of the advances since the time of Harvey. TERENCE EAST.

Correspondence

Second Thoughts on Proguanil

SIR,—Your issues of Jan. 15 and 29 have only just reached me. I have read with great interest the article by Sir Gordon Covell, Dr. W. D. Nicol, and Messrs. P. G. Shute and M. Maryon on "paludrine" (proguanil) in prophylaxis and treatment of malaria (Jan. 15, p. 88), your leading article (p. 106) entitled "Second Thoughts on Proguanil," and Sir Gordon Covell's letter under the same title (Jan. 29, p. 192).

It has long been clear that not all the claims made for proguanil have been substantiated nor all the hopes fulfilled. I agree, however, with Covell that your leading article overstated the case against proguanil, especially in strongly suggesting that it causes loss of appetite, weight, and energy in those using it in prophylaxis. Since coming to Nigeria I have experienced no such symptoms or even heard of them in others taking prophylactic proguanil. Covell's view that, in spite of certain limitations as a therapeutic agent in an attack of malaria, proguanil has a vast field of usefulness is amply justified.

We tend to judge the value of antimalarial drugs too much by their efficacy in controlling and eradicating malarial infection in Europeans, who have little or no acquired immunity to malaria. The millions of indigenous inhabitants of malarious areas in the Tropics and sub-Tropics are of far more importance, and they often present quite a different problem from that of the European with malaria or exposed to malarial infection. In such populations the three main requirements in an antimalarial drug are cheapness, reasonable effectiveness, and non-toxicity. The need for cheapness is obvious, for such populations are usually very poor. Reasonable effectiveness should include the power to control the fever, to prevent serious complications in the majority of cases, and to enable the patient to resume full activity at an early date. In such populations the eradication of the malarial infection is often undesirable as well as unattainable. Such eradication will almost certainly interfere with the establishment or the maintenance of the acquired immunity which keeps the adult population, at any rate, reasonably free from severe malaria. Moreover, reinfection is often certain, and is likely to be more serious in persons whose previous infections have been eradicated.

Non-toxicity is, I believe, of vital importance, for treatment often has little or no medical supervision. This is where proguanil scores so heavily over mepacrine and even quinine. Covell and his co-authors refer to the toxic effects of mepacrine as being of rare occurrence but by no means negligible, and especially mention mepacrine psychosis, with mental aberration and sometimes maniacal excitement. Your leading article makes light of this and quotes Findlay's figures (1.71 per 1,000) for its incidence in persons taking mepacrine prophylactically or therapeutically. Regarding mepacrine psychosis occurring on prophylactic doses I know little, but such cases are on record. Psychosis on therapeutic doses is far more common, and other authors have quoted far higher figures than Findlay. (I am far from libraries here and cannot give references.) My own experience in the civil population in India in wartime showed that mepacrine psychosis was a very real problem even on a low dose. The theory that it was caused by the malaria and not by the mepacrine has been disproved by the production of the psychosis in an appreciable proportion of healthy volunteers on an ordinary therapeutic course of mepacrine totalling 2.8 g. Admittedly the incidence of psychosis is usually not high; in a disciplined army or in an educated population it will not be a major problem. But in other circumstances the situation will be very different. Only those who have tried to popularize and use mepacrine widely in the little-educated people of a malarious area realize what a devastating effect even a low incidence of psychosis can produce.

Briercliffe, in the very severe malaria epidemic in Ceylon in the 1930's, was possibly the first person to attempt to use mepacrine widely in such circumstances. In his most interesting report on the epidemic he stated that on a dose of 0.3 g. a day for five days the incidence of psychosis was enough to make the drug so unpopular that its use had to be abandoned in certain valleys affected by the epidemic. In some parts of India in recent years cases of mepacrine psychosis have made the drug extremely unpopular.

All this trouble is avoided by the use of proguanil. I note with interest Covell's suggestion that in the treatment of the attack of malaria mepacrine should be given with proguanil for the first day, and thereafter proguanil only. I agree that the risk of mepacrine psychosis should be greatly reduced, if not abolished, by this means and the efficacy of the treatment increased. In my experience mepacrine psychosis occurs only at or after the end of a course of mepacrine administration lasting at least four days.

I entirely agree with Covell when in his letter he re-emphasizes the great field of usefulness of proguanil in prophylaxis and in treatment in the populations of malarious areas. There appears to be at the moment no other drug which possesses to the same degree the properties essential in such circumstances.—I am, etc.,

Uzuakoli, N.E.R., Nigeria. JOHN LOWE.

Strain and Paralytic Poliomyelitis

SIR,—The application of *x*-ray therapy in the vicinity of epiphyses and growing bone generally is now recognized as carrying with it a risk of interfering with normal growth, and therefore should be avoided if possible. However, the following case is instructive in several ways:

A child 2 years of age was treated in 1941 with quite moderate doses of *x* rays on account of an extensive haemangioma involving the whole of the left leg and buttock. Treatment was directed especially to the foot, which was hypertrophied, but also in smaller amount to the lower half of the left thigh as far as the line of the knee-joint. The haemangioma improved, but during the past two years a slight under-development of the whole leg has been noticed, both in length and girth. I ascribed the condition partly to the previous haemangioma and partly to the irradiation. Recently the child was brought to me on account of falling down without any apparent cause and walking with difficulty. It was evident that the trouble was the leg which I had treated and which I knew to be weaker than the other. An orthopaedic surgeon immediately recognized that the quadriceps muscle was flaccid and that the cause was anterior poliomyelitis. A previous slight malaise with transient pyrexia had been noticed one week previously. The question occurred to me, *Why* should the disease pick on this unfortunate leg? and a possible answer was that it was due to the fact that the leg was weaker than the other and therefore more strained.

Dr. W. Ritchie Russell's masterly article (March 19, p. 465) on the incidence and prevention of serious paralysis has brought this matter vividly to my mind. If my explanation is correct it would suggest that even slight strain may be sufficient to initiate the paralysis, as the difference in strength between the two limbs was previously insufficient to cause anything noticeably unusual in the gait. That the weakened leg was affected by chance is possible, but Dr. Ritchie Russell's findings support the view that it was not so.—I am, etc.,

Stoke-on-Trent. GEORGE G. BINNIE.

SIR,—Dr. W. Ritchie Russell is to be congratulated on his illuminating and graphic account of poliomyelitis (March 19, p. 465). He is to be particularly congratulated on having drawn attention to the possibly far-reaching implications of the relationship between trauma and the development of paralysis. It is only too easy to dismiss such an observation as being either accidental or of no particular importance, but the history of medicine provides many examples of the rich reward to the worker who, perceiving the possible implications of an apparently anomalous finding, follows it up and elucidates its meaning.

If, as Dr. Ritchie Russell suggests, a non-specific stimulus such as minimal trauma is able to modify the physiology of the central nervous system in such a way as to make it more vulnerable to a specific virus infection, then the orthodox conception of the nature of the battle between host and invading organism needs to be reviewed. It will need to include more than a consideration of the number and virulence of the organisms and the antibody and defence reactions of the host. The previous experience of the nervous system will also have to be taken into account.

Speransky, whose book, *A Basis for the Theory of Medicine*, is largely concerned with a study of the role of the C.N.S. in infective diseases, quotes many experiments in line with those referred to by Dr. Ritchie Russell. For example, he shows that after freezing an area of cerebral cortex there is a critical time within which the traumatized area must be excised in order to prevent the subsequent development of epilepsy. After this interval a process is generated in the C.N.S. which is independent of the original stimulus and which has its own dynamism. He shows that an intramuscular injection of tetanus toxin will be ineffective in causing local tetanus if the nerves supplying the muscle are first cocainized, even though potent toxin can be demonstrated in the nerve trunks about the block. Apparently the specific stimulus of tetanus toxin requires to reach the C.N.S. through the nerve endings.

In a case of recovered tetanus he was able, months later, to provoke a recurrence of the spasms by a "second blow," such as a non-specific injury to a nerve. It was as though the pattern of tetanus had been implanted in the C.N.S. and the specificity of response to subsequent trauma resided more in the C.N.S. than in the nature of the traumatizing agent.

It may be that this approach will throw light on the nature of "susceptibility" and give a deeper meaning to Osler's dictum that there are no illnesses—only ill people. No doubt much of Speransky's work will need to be checked and revised, but, having assimilated its basic concept, it is scarcely possible to spend a day in clinical work without receiving a hint—however tenuous—that the role of the C.N.S. in integrating pathological processes and in organizing their peripheral manifestations is of profound importance to the understanding of medicine.—I am, etc.,

Birmingham. J. S. HORN.

Haematemesis

SIR,—Drs. D. C. Lewin and Sidney Truelove (March 5, p. 383) make the interesting suggestion that in haemorrhage from peptic ulcer the fatality rate is influenced much more by the age of the patient than by the chronicity of the ulcer. I believe that there may be a fallacy in their argument, which involves deducing the pathological state of the ulcer mainly from the duration of the dyspepsia. In his Goulstonian Lectures on the subject of haematemesis and melaena (Sept. 20, 1947, p. 442, and Sept. 27, 1947, p. 478) Avery Jones showed, concerning bleeding from gastric ulceration, that the total history of dyspepsia was no longer in the case of the chronic than in that of the acute lesion. Experience suggests that this may also be true of duodenal cases. Indeed, Drs. Lewin and Truelove recognize this difficulty when they say, "A certain number of patients in the 'unknown' or 'acute ulcer groups' were later found to be suffering from chronic peptic ulcers."

While acknowledging that the authors have done valuable service in re-emphasizing the lowered resistance to haemorrhage of the older patient, I feel that nothing should be allowed to obscure the fact that death is almost always due to bleeding from a chronic ulcer with which arteriosclerosis is often associated.—I am, etc.,

Liverpool. NORMAN GIBBON.

Artificial Insemination

SIR,—The attack launched upon the Medical Defence Union by the Archbishop of Canterbury and by Lord Merriman during the House of Lords debate on artificial insemination (reported in the *Journal* of March 26, p. 550) appears to be misdirected and perhaps due to a failure by each of them to appreciate the function and services of that body. It is possible that they may labour under the conviction that the Union sponsors or advocates a particular line of treatment such as artificial insemination. This is not so. The decision whether artificial insemination will constitute appropriate treatment for any given patient rests within the judgment of the doctor in attendance. He and he alone can determine whether or not it is fitting and proper to recommend that line of treatment to remedy a sterile marriage.

The Union, fulfilling a primary function defined in its Memorandum, has consistently warned its members in a suitable manner of the medico-legal dangers associated with artificial insemination. It has pointed out that they may be accused of negligence, of adultery, or of conspiracy. It has shown to those who desire to undertake this form of therapy the precautions that they should adopt, and it has published two documents which it has been advised by its solicitors are suitable for completion by the parties concerned. It holds no brief for any person who knowingly commits perjury at the time of the registration of the child that is the result of A.I.D.

If the Archbishop's commission had afforded the Union an opportunity of appearing before it when it was in session it is just possible that the persons appointed to give evidence on its behalf would have removed some of the unfortunate misapprehensions that appear to have arisen in their minds.

The law may require alteration, but this should only be effected, if necessary, after the matter of artificial insemination has been fully explored by a Royal Commission or a departmental committee. It would be unfortunate if the Church were once more to align itself with the opponents of a new form of therapy before that therapy has been properly examined by competent authorities and either condemned or confirmed.—I am, etc.,

London, W.C.1. ROBERT FORBES, Secretary, The Medical Defence Union.

The Arab Refugees

SIR,—The Jewish Society for Human Service is concerned for the Arab refugees, victims of the fighting in the Middle East and now said to number three-quarters of a million. "Their state," wrote *The Times* correspondent in Jericho on Feb. 21, "beggars description." In particular, there is a disastrous shortage of drugs. Of the larger donations promised by governments only the British million pounds has been paid—a pound or so per head of refugees who must be fed, clothed, housed, cured. I have it on the authority of a Minister of the Crown that drugs are so short simply because food is the priority and there is not nearly enough money for everything.

May I beg your readers to send a contribution for this purpose to the Jewish Society for Human Service, 14, Henrietta Street, London, W.C.2? As the Society is collecting for many other needs of these refugees, contributions should be earmarked "Drugs for Arab Relief."—I am, etc.,

London, W.C.2. VICTOR GOLLANCZ.

Psychiatric Indications for Abortion

SIR,—The annotation on psychiatric indications for abortion (March 19, p. 489) supports the view that with the advent of family allowances, maternity benefit, and a comprehensive health service there is less indication for abortion on "social grounds." From your observation that "nevertheless the over-prolific family will continue to suffer hardship" it is clear that the term "economic" should have been substituted for "social." You go on to say that in Switzerland, where changes in the law relating to abortion have been introduced, the remedy of sterilization is provided for the over-prolific family. You conclude your annotation by suggesting that the wider use of sterilization in women who are unfitted to bear and to rear children would reduce the number of occasions when difficult decisions have to be taken about the therapeutic termination of pregnancy.

In the first place, I venture to suggest that economic factors alone neither justify termination of pregnancy nor sterilization, and in practice it is extremely rare for a request for either to be made on such grounds. When economic factors are advanced it is usually by parents, who sometimes cannot do justice to their existing children. They are invariably quite comfortably off, have planned a small family, and budgeted accordingly. Really badly off parents, who sometimes cannot even afford a contraceptive appliance, never seem to worry very much over the threat to their economy constituted by an unexpected pregnancy. The anxiety reaction on the part of the moderately well-off planning parent is always much greater than that of her hard-up and haphazard contemporary.

Is it seriously suggested that the payment of family allowance or the provision of a free maternity service is going to make all the difference between affording and wanting another child and requesting an abortion or sterilization? To what extent is it considered that the comprehensive health service will

ameliorate the lot of a deserted, unstable, and unmarried mother who has to support an invalid parent?

There are no definite psychiatric grounds for termination of pregnancy. Each case must be considered on its merits. The admission of a suicidal patient to hospital in preference to terminating the pregnancy which determines the morbid impulse can only be justified under very exceptional circumstances. If hospitalization is deemed necessary, surely the severity of the condition warrants removal of the cause, in preference to perpetuating it under conditions which are less favourable and acceptable than those in which the patient was originally situated. It should not be difficult to decide when a pregnancy should not be terminated. There can be fewer occasions on which it could be considered wiser to follow the old adage, "When in doubt, don't."

Finally, in my view there is too much glib reference to sterilization of women. There are few indications for sterilization in women which cannot be dealt with adequately by sterilization of the men. In any case sterilization should never be resorted to on such a variable factor as the economic position of the family. Obviously they have no football pools in Switzerland.—I am, etc.,

London, W.1. ELLIS STUNGO.

Diagnosis of Early Pulmonary Tuberculosis

SIR,—About two years ago, in common with many other practitioners, I received from the National Association for the Prevention of Tuberculosis a pamphlet on the diagnosis of early pulmonary tuberculosis by Dr. C. H. C. Toussaint, of Bermondsey, and in the last few days I had a second copy. Everyone will agree about the importance of early diagnosis of tuberculosis, but are we helped by this list of indications for immediate *x*-ray examination?

Cough, Bronchitis, Dyspnoea, Laryngitis	including senile patients	Influenza Febrile chill P.U.O. Pleurisy, pleurodynia, or pain in chest
Lassitude Bronchial catarrh Haemoptysis Ischiorectal abscess Erythema nodosum		Loss of weight Anorexia Anaemia Debility Amenorrhoea

particularly females 15–30

Now it may well be that most (if not all) cases of tuberculosis of the lungs have one or more of these symptoms at some time before diagnosis, but so do a very great number of others who have no tubercle. Can we in fact, by taking these symptoms as guides, separate out a body of patients of manageable size among whom we may hope to find the majority of the cases of tuberculosis?

I made two counts of my patients; one in July, 1946, gave 17 cases in one week, and one this year, March 8 to March 14, gave 54 cases showing one or more of these symptoms. My total list is 3,000. Even on the summer figure it would mean something over 1 in 4 of my patients in the course of a year—or for an *x*-ray plant dealing with 50,000 people more chest radiographs in one week than they now do in a year. Films are in short supply even now, and could the tuberculosis officers cope with the numbers?

Indeed, Sir, I would not have troubled you at all about it except that there seems here to be a good idea gone wrong by some exaggeration or want of precision in the presentation of the case.—I am, etc.,

King's Langley. REGINALD FISHER.

Ankylosing Spondylitis

SIR,—In the *Journal* of March 12 (p. 455) you print a letter from Dr. K. Sicher in which he discusses the results of *x*-ray treatment. I have now had the opportunity of observing such results for nearly 20 years, as I began to work with Gilbert Scott on this subject in 1931 and have seen and treated over a thousand cases.

Usually, but not always, the earlier the case is seen the better the outcome. But a few early cases get worse despite treatment. Some people are extremely sensitive to *x* rays, and relative overdosage at the start may destroy their resistance for months or even years. All symptoms may be banished and apparent arrest of the disease brought about by dosage of the order of one-third to one-half of the 2,500 r referred to. Professor Davidson, of San Francisco, uses even less.

Does the very large dose really eliminate the disease? There is little to indicate that this is so and much to prove the contrary. Exacerbations occur after months or even many years. Meanwhile the B.S.R. is a totally unreliable guide. It is as a rule normal during quiescent periods. But Professor Davidson has shown that the 17-ketosteroids continue to be excreted in excess during remissions, and certain newly discovered biochemical tests, such as those dealing with serum viscosity, are often positive despite normal B.S.R. and absence of symptoms. And what of the 35% of later-stage patients whom Dr. Sicher finds it impossible to benefit by *x* rays? Is their sole resort to be the orthopaedic surgeon, who, after all, deals with the results of the disease rather than the disease itself?

Very small doses of *x* rays, carefully graduated, will be found to be the answer in some cases; but there remain a considerable number who will require the same continuous care and attention as cases of chronic rheumatism. If cure, or even complete remission, is not possible, nevertheless an attempt should be made to keep such people fit for work and play. To this end any of the usual anti-rheumatic remedies may have to be employed. Gold may be useful, but it has not the dramatic effect which is often observed in rheumatoid arthritis and should be given only in very small doses, say 0.001 g. weekly. Polyvalent anti-rheumatic vaccines may also be tried in doses not sufficient to produce general or focal reaction. Bismuth is an alternative to gold, in doses of 0.5 g. of sodium-bismuth tartrate once in two weeks. Finally, there is radioactive thorium X, which requires expert administration.

Too often spondylitic patients are told by their doctors, "Nothing can be done." This is nearly always far from the truth.—I am, etc.,

London, W.1. F. HERNAMAN-JOHNSON.

Occupational Therapy

SIR,—We have read with interest the review (March 5, p. 397) by Dr. Donald Stewart on *Principles of Occupational Therapy*, edited by Helen S. Willard and Clare S. Spackman. We should like to endorse most sincerely his comments regarding medical prescriptions for occupational therapy. The need for these is felt very strongly by occupational therapists in this country, and they have been striving for them since the earliest days of the profession.

The only points in his review of this book about which we are not entirely happy are the comments, "The authors' description of the ideal organization of a hospital department of occupational therapy may well inspire *physiotherapists* in Great Britain . . . to demand a more important place in the hospital hierarchy"; and again, ". . . will be of wide interest and help to *physiotherapists*" (my italics). We feel that occupational therapists will also be helped and inspired greatly by this book, and as occupational therapy and physiotherapy are entirely different though frequently interdependent forms of treatment we cannot help feeling that the omission of reference to the occupational therapist is an oversight.—I am, etc.,

London, S.W.3. JOYCE OLDNALL, Secretary, Association of Occupational Therapists.

Penicillin-resistant Staphylococci

SIR,—It would appear from the preamble and summary to the paper entitled "Frequency of Penicillin-resistant Staphylococci" (March 5, p. 395) that the authors, Drs. A. Voureka and W. Howard Hughes, in recording a 7.6% incidence, are satisfied that penicillin is not losing much ground as an antibacterial agent in the treatment of staphylococcal infection. They believe that previous reports have tended to create an exaggerated impression of the waning power of penicillin.

While these authors make no direct reference to the recent work of Barber,[1 2 3] one is bound to draw a comparison between the two sets of results. Barber has reported a progressive increase in the percentage incidence of resistant strains from

14% in 1946 to 59% in 1948. Her studies were carried out in a large hospital and her findings represent the percentage incidence of hospital infections due to penicillin-resistant strains. She freely admits that "though penicillin-resistant strains of *S. pyogenes* are now appearing with increasing frequency in many hospitals, this is probably not the case in the community at large."

The strains investigated by Drs. Voureka and Howard Hughes were recovered from the anterior nares of out-patients not suffering from obvious staphylococcal infection. In other words their figure of 7.6% is simply an index of the number of temporary nasal carriers of penicillin-resistant staphylococci. Admittedly 185 of 304 strains were coagulase-positive, but the production of staphylocoagulase implies potential rather than actual pathogenicity.

During 1948 a survey of strains from in-patients and out-patients suffering from staphylococcal infection was undertaken at the Kent and Canterbury Hospital. A report on this study is being prepared for publication, but it would seem timely to give a brief summary in advance. Of out-patient strains, 90% were sensitive and 10% resisted at least 1 unit of penicillin. By contrast only 32% of hospital strains were sensitive. All the resistant strains produced penicillinase. In assessing the value of penicillin in the treatment of staphylococcal infections on the basis of the frequency with which resistant staphylococci are encountered due regard must be paid to the source of the strains investigated.—I am, etc.,

Canterbury, Kent. G. B. FORBES.

REFERENCES
1 *J. Path. Bact.*, 1947, **59**, 373.
2 *British Medical Journal*, 1947, **2**, 863.
3 *Lancet*, 1948, **2**, 641.

Specialization

SIR,—Another heading might be added to those that Dr. S. Leonard Simpson makes in his letter (Feb. 26, p. 368) : the attitude of the patient towards specialists. One of the promises of the so-called Health Service was of "specialist treatment available for all." Although the operative word is "available," many patients must see this as "specialist treatment for all." Of course "all" do not need specialist treatment, but if they think they are entitled to it they are quite liable to ask for it (the Englishman standing up for his rights). And on what grounds can a G.P. refuse? Only that he does not think it necessary. This does not always go down with the patient, who wants to see specialists.

Doctors who have been in the Army will remember how soldiers on sick parade, when asked their trouble, would reply (for instance), "I want to see the E.N.T. specialist." The doctor's "What about?" startled them like an impertinent question. "Me ears," they would reply. Then, if the medical officer actually looked at their ears, they were puzzled; and if he went so far as to treat them for their troubles they thought it very queer indeed. Surgeries, like sick parades, are in danger of degenerating into sessions at which all that the patients have come for is a chit to see someone else. Eventually the G.P. has only the patients that the chemist used to get, and the specialists get the G.P.'s patients.

There is a danger, too, of doctors achieving the label "specialist" without really knowing a great deal more about their special subject than the average G.P., and it will happen this way. There will be thousands of patients wanting to see specialists about their very special ailments, and someone will pipe up in Parliament that we have not enough specialists. "Then create some," the Minister of Health will say, with a grand gesture. This is what happened in the Army. The Army decided that beyond anything soldiers required psychiatrists. And, behold, there were psychiatrists. As the war started there cannot have been so many civilians deserving the title "psychiatrist"—yet the Army was thick with psychiatrists. This was done by the simple process of inviting all M.O.s with the slightest experience in psychiatry to apply for "grading" in psychiatry. So, as well as the genuine psychiatrists, there were myriads who had had the minimum training, whatever it was. (Something like six months H.P. in a mental hospital.) Such a hilarious state of affairs in civilian practice is not likely to arrive for the present generation of doctors and patients, but as new specialist-minded generations grow up, and the N.H.S. "progresses," everything will become much more organized. Who will then be the G.P.? A different sort of person will have to go in for medicine. The Civil Service type of mind will be attracted to the profession, and scientific youngsters of school-leaving age will enter something more exciting than the medical schools.—I am, etc.,

Windlesham, Surrey. MARGARET C. TAIT.

Pharmacology of the Failing Heart

SIR,—I would like to make some remarks on the article by Professor J. McMichael (Nov. 27, 1948, p. 927). If I would discuss every point in this article with which I disagree it would take up too much of your space, and in many respects it would only lead to repetitions of my teachings which are contained in my book, *Physiology and Pathology of the Heart and Blood Vessels*, Oxford University Press, 1947.

If Professor McMichael would have taken the trouble to read the relevant paragraphs in this book about the effects of digitalis and about the factors which determine the output of the heart (p. 30) he would have made his work more easy and valuable. He would surely have noticed that not only in my mathematical deductions (p. 6) but in my practical conclusions one cannot neglect the most essential factor for the performing of the stroke volume—e.g., the dilatability of the ventricle. Thus the main effect of digitalis lies in the diminution of the diastolic resistance of the diseased ventricle. If he had drawn this neglected factor into account in his speculations he could have easily explained all his conclusions and doubts, and even why digitalis has no effect on a healthy myocardium.

I am full of admiration for Forssman's bold method of the heart catheterization, but it seems to me that it can hardly give more information than my method either for the determination of the stroke volume or for the diagnosis of the congenital vitia. Certainly, by the application of a catheter into the heart cavities the results of the examination cannot be regarded as the results of a normal heart function. For this and other reasons I wonder why Professor McMichael became so enthusiastic about this by no means indifferent method, and why he abandoned my method, which served him in all his previous work so well.

Many people who have been informed only through the publications of Professor McMichael about his haemodynamic experiments will surely be surprised to hear my claim to be the father of the method which has been applied by Professor McMichael. Heaven only knows what prejudiced him to constantly attribute my sack method to the late Professor Fick, who made his suggestions in the 'eighties of the last century (namely, Vierord's *Daten und Tabellen*, p. 161), and which induced many authors of great repute like Grehant and Quinquaud, Zuntz, Hagemann, Loewy, von Schroetter, Wolfberg, Nussbaum, etc., to try to realize the proposal of Fick. But all the attempts did not lead to any practical result. Only in 1906, when I invented my sack method, was it possible to determine the stroke volume of the heart on the basis of Fick's proposed principle, and to lay the basis of our present knowledge of human haemodynamics. All this shows clearly that Fick had no method of his own for the determination of the stroke volume.

In a great series of experiments I proved my methods and published them first *in extenso* in a monograph, "Haemodynamische Studien," in 1909. The essentials of the invention are to respire, for a short time, in a sack filled with nitrogen until the tension of the gases of the blood in the right heart are in equilibrium with the gases in the sack. The analysis of the partial pressure of O and CO_2 in the sack expressed the amount of the blood gases in the right heart. The determination, in connexion with the determination of the O_2 capacity of the blood, further with the determination of the oxygen demand of the body, and the determination of the blood volume and the pulse rate, gave me the opportunity not only to determine as the first in physiological and pathological cases the stroke volume, but all the other haemodynamic features in the living human body. This method has never been superseded, in spite of the fact that many authors have attempted to modify it by insignificant trifles. The 76 sentences of my conclusions stand to-day as firmly as they did 40 years ago.

In the same year as I published my "Haemodynamics" I wrote a treatise, "Zur Diagnose der kongenitalen Vitien," in the *Deutsche Medizinische Wochenschrift*, No. 9, 1909. I used the sack method for the diagnosis of the cor triloculare, where, as is well known, the

blood of the left and the right heart becomes mixed and thus changes the blood-gas concentration in the right heart accordingly.

We have possessed, therefore, for 40 years a simple, harmless method for the determination of the gases in the blood, and now the same determination is recommended as a novelty with only the difference that the blood is taken through a heart catheter, which is by no means an indifferent measure and which represents an encroachment on the physiological conditions of the circulation.

Had Professor McMichael further taken the trouble to study my books, which, to my greatest regret, I must admit are not easy to understand for everybody, he would surely have rather accepted my subdivision of the cardiac failures in diastolic and systolic insufficiencies and their implications instead of recommending his subdivision of high or low output in failures of the heart, which has no practical significance whatsoever. He also could have learned that his ideas about "back pressure effect" are, plainly speaking, nonsense. This conception of his proves clearly that he is mixing up in his mind fundamentals of hydrostatics and haemodynamics. He must at least realize that in a closed channel system, as the blood circulation represents, and where the atmospheric changes are negligible, other rules are valid than in the flow in open channels, as in a river, where the flow is decidedly influenced by atmospheric changes.

I trust that Professor McMichael will revise the results of his publications according to these suggestions.—I am, etc.,

London, W.1. J. PLESCH.

Physiology of the Orgasm

SIR,—The publication of Berg's *Clinical Psychology* once again raises the issue of the place of the orgasm in the therapy of the neuroses. The problem was originally stated by Reich, but received negligible discussion at the time. Reich subsequently developed the concept of orgastic potency as a therapeutic end-point, and developed a technique which he considered to be soundly based on the physiology of the autonomic system. If Berg's latest work is an indication that the orgasm is to be discussed once again by psychiatrists, it seems a wise preliminary to correct past errors in orgasm physiology. Discussion can then take place on a scientific basis.

Following Reich, Berg thus describes the orgasm in terms of parasympathetic discharge :

"An exceptional degree of sexual tension, conducted along the parasympathetic, would tend to discharge itself as orgasm, whereas an excessive degree of anxiety tension, conducted along the sympathetic system, would lead to a condition described in medicine as 'sympatheticotonia,' and would tend to discharge itself in some such phenomenon as an hysterical outburst."

This is an incorrect statement of the position. The standard works on the autonomic nervous system (Kuntz, White, and Smithwick) show that the orgasm is a brief period of acute sympatheticotonia occurring at the end of a period of parasympathetic predominance. The latter is the basis for tumescence, and the sympathetic discharge from the upper lumbar segments causes the contraction of the musculature of the genital tract. In these circumstances the physiological basis of Reichian therapy requires complete reassessment.—I am, etc.,

London, N.W.3. P. D. EEMAN.

POINTS FROM LETTERS

Scottish Proverb

Dr. J. B. MILLER (Bishopbriggs, Lanark) writes: In a letter on "Whither Tuberculosis?" Dr. Patrick Heffernan (Feb. 26, p. 365) uses the following quotation: "Keep its ain fish guts for its ain fish maws." There are several versions of this old Scots proverb, but all agree that the last two words are "sea maws"—i.e., sea mews or gulls. It is of interest that this was a favourite proverb of Sir Walter Scott and is quoted in *The Antiquary* (chap. 15) as follows: "We maun gie our ain fish-guts to our ain sea-maws" (i.e., of course, that charity begins at home).

Obituary

WILLIAM JOHNSON, *M.C.*, M.D., F.R.C.P.

In all professions there are men and women whose promotion to high office has been due primarily to their solid worth and trustworthiness; their desire for publicity has been small, and only those colleagues who have worked intimately with them have been in a position to assess their other attributes and professional qualities. Such a man was William Johnson, whose death on March 15 at the age of 63 after a brief illness has brought sorrow to his many friends. A reserved and modest man, rather shy, yet possessing a most warm and friendly nature, he was beloved for his generosity of spirit and for his plain and simple faith. It was only natural that his ability as a physician and clinical teacher and his wisdom in counsel should be widely recognized by his appointment to many offices, all of which he held with distinction. To each task he brought a well-trained, mature mind, full of sound common sense and a rich measure of human understanding.

William Johnson received his early training at Guy's Hospital. After graduating in 1908 he held several resident posts at Guy's and then embarked upon his career as a physician with a special interest in neurology. He was chief clinical assistant in the neurological department at Guy's Hospital, and he proceeded M.D. in 1911 and took the M.R.C.P. in 1912. In the first world war he served with distinction in France, being awarded the Military Cross for conspicuous gallantry and devotion to duty. While on active service, with the rank of major, R.A.M.C., he enjoyed opportunities for pursuing his studies in neurology, and he contributed the article on "Neuroses in France" to the official *Medical History of the War*.

After demobilization Johnson decided to engage in consulting practice in Liverpool, and he was appointed assistant physician to the Royal Southern Hospital and to the Royal Liverpool Children's Hospital. He served these institutions with efficiency and loyalty, and in due course became senior physician to both of them. When his period of active service on the staff came to an end both hospitals showed their appreciation of what he had done and their desire to retain his support and advice by appointing him to their respective governing bodies.

Johnson was elected F.R.C.P. in 1926, and among other appointments he held that of lecturer in clinical medicine and clinical paediatrics in the University of Liverpool. He was president of the Liverpool Medical Institution in 1939, and at the time of his death he was president of the Section of Neurology of the Royal Society of Medicine. These offices brought him much pleasure, but his appointment as censor by the Royal College of Physicians of London was naturally the distinction which pleased him most, and no words could have expressed the gratification which he obviously felt on being selected for this honour. The holding of these and other important offices, including examinerships for the Universities of Durham and Liverpool, and for the Conjoint Board, did nothing to impair his close friendships, many of which were with men much junior to himself. He remained true to his pattern, strong in character, gentle, lovable, and loyal by nature, the best of friends. His greatest fortune was in the happiness which his wife and children brought to him, and they have our sympathy in their great sorrow.

So passes one who played a man's part in life and leaves it rich with grateful memories. Sir William Osler expressed the opinion, in *Aequanimitas*, that in the physician or surgeon no quality takes rank with imperturbability. Not everyone would agree that this attribute comes first, but by common consent it would certainly be placed high among the requisites of a good doctor. Imperturbability was but one of William Johnson's many qualities; and his epitaph might well be those words of Marcus Aurelius with which Osler prefaced his lecture—"Thou must be like a promontory of the sea, against which, though the waves beat continually, yet it both itself stands and about it are those swelling waves stilled and quieted."—N. B. C.

PHILIP BRUCE WHITE, F.R.S.

Philip Bruce White, who died on March 19 at the age of 57, belonged to the rare genus of truly original research workers. Had he lived the full allotted span he could not have failed to add many further contributions to the rich legacy he bequeathed. Although of Scottish descent he was brought up in Bangor, for his father, Philip Jacob White, was the first lecturer in zoology, and later professor of that subject, in the University College of North Wales. It was to his father that he owed an unusually early interest in biological science combined with unique opportunities during childhood and adolescence for its exercise and development. His strong inborn curiosity was thus fostered and led to the acquisition of a width of knowledge and experience which often surprised even his closest friends.

His formal education was obtained first at Friar's School, Bangor, and later at the University College of North Wales, where he took an honours science degree in 1915 with zoology and botany as his principal subjects. His original intention had been to proceed to a medical degree, but to a man of Bruce White's temperament some direct contribution to the war effort was an urgent necessity. Ineligible for military service because of the results of an accident at school, he served a brief apprenticeship in bacteriology at the Lister Institute and a short period as assistant pathologist at Trinity College, Dublin, before obtaining an appointment at Tidworth Military Hospital as a civilian pathologist, in which post he remained until the conclusion of hostilities. In 1919 he went to Aberdeen to assist in an investigation of Isle of Wight disease of bees. The solution of the problem of the aetiology of this disease was an outstanding piece of research for which Bruce White was largely responsible. A few years later he joined W. G. Savage in Bristol in an investigation of food poisoning, sponsored jointly by the Medical Research Council and the Ministry of Health. This was the starting point of his long series of researches on the salmonella, which continued for over a decade and firmly established Bruce White's reputation both as a bacteriologist of note and as a world authority on this group of organisms. His appointment to the scientific staff of the National Institute for Medical Research in 1927 provided the facilities requisite for his intensive study of the antigenic constitution and relationships of the salmonella. Upon that study are based the modern diagnostic methods now in use in laboratories all over the world. This work was followed by similar investigations into the cholera vibrios, which continued almost to the day of his death. An invitation to visit India in 1946 provided an opportunity, eagerly seized, of studying epidemic cholera in the field, and in the following year he went to Egypt to investigate the Cairo outbreak. Side by side with these fundamental researches Bruce White carried out a great deal of notable work in connexion with the preparation and assay of biological standards under the auspices of the Health Organization of the League of Nations. His high scientific attainments were recognized in 1941 by his election as a Fellow of the Royal Society.

Outside his work Bruce White had wide interests. He keenly appreciated many forms of art, and he loved the literature, wines, and cooking of France. He brought zest to all his activities whether serious or trivial, and lived life with a gusto which stimulated those around him. The kindest and most approachable of men, he was nevertheless a shrewd judge of character and could deflate pretence and pomposity with a penetrating comment or witty phrase. Unconventional, unself-conscious, and possessing physical and mental courage of high degree, he was a good companion who will ever be remembered with affection by those who gained the privilege of his friendship. He leaves a widow and two sons, both of whom have adopted the profession of medicine.—W. S.

Dr. ANDREW CONNAL died at his home in Aberdeen on Jan. 26 at the age of 66. Dr. Connal was born in Glasgow and educated at Hillhead High School and later the High School of Glasgow. In 1903 he graduated M.B., Ch.B. at Glasgow University. After holding a number of resident appointments he was given the opportunity of accompanying Sir James Simpson on a special plague mission to the Gold Coast. Returning to Glasgow in 1909, he took his M.D. degree with highest honours, and had the distinction of being awarded the Bellahouston Gold Medal for his thesis on cerebrospinal meningitis. At the London School of Tropical Medicine he obtained the diploma in tropical medicine and hygiene in 1910, and two years later he took the Cambridge D.P.H. Dr. Connal's work in the West African Medical Service, which he joined in 1909, obtained early recognition. He was appointed director of the Medical Research Institute at Yaba, Lagos, and he became also deputy director of the laboratory service of Nigeria. He held these appointments until he retired from the Service in 1931. During this long period of twenty-two years he was in the forefront of advances in tropical medicine, and he made a special study of filariasis. In all his laboratory work he had the able and devoted assistance of his wife, by whom he is survived. For his services to medicine in West Africa, Dr. Connal was awarded the O.B.E. in 1932. He especially loved Galloway, and it was there that he made his home when he returned to Scotland. Still comparatively young in age, and essentially young in spirit, he felt there was work yet to do. His appointment as assistant M.O.H. to the Kirkcudbright County Council gave ample scope for his experience in the field of preventive medicine and in the treatment of infectious diseases. Quietly efficient, conscientious, and supremely loyal, he did not spare himself during the fourteen years that he devoted himself to this work. At the end of the recent war he was offered the post of medical officer and lecturer at the Training College, Aberdeen. Here he found a life that was congenial and that gave a fresh outlet to his talents. His popularity with the students and the affectionate regard in which he was held by the staff were a tribute to his outstanding character and to his abilities as a fine teacher and loyal friend. Andy Connal was a truly generous soul. He was the perfect host, and the doors of his home were always opened wide to his many friends. While he shunned the glare of public life, his private acts of generosity were as numerous as they were unostentatious. He lived a full life, and he was exceptionally well informed on subjects far removed from medicine. As a golfer he played with zest; as an amateur gardener he could speak with authority. But it was perhaps in angling that he found his favourite recreation. Every summer he spent some weeks at Scourie, where he knew every loch and burn for miles around. Gifted with a keen sense of humour, he could see all things in their true perspective. His charming courtesy, his sincerity and modesty, were attributes that endeared him to all who knew him.—D. J. M.

Dr. HAROLD JULER CUNDELL died on Feb. 18 at his home at Tadworth, Surrey, at the age of 70. He was born at Kew, the son of the late Dr. George Richard Cundell, a former mayor of Richmond. He was educated at St. Paul's School under the redoubtable F. W. Walker. There he got his first XI cap as a fast bowler and a dashing, if somewhat unorthodox, batsman; he was also a good rugby footballer. From St. Paul's he entered the medical school of St. Mary's Hospital, Paddington, and he took the M.R.C.S., L.R.C.P. in 1902. He was house-surgeon at the Huddersfield Infirmary, and afterwards resident medical officer at the Three Counties Mental Hospital, Arlesey, and at the Horton Mental Hospital, Epsom. He then spent some years in general practice at Leeds, and from 1911 to 1935 at Liverpool. From 1935 to 1948 he practised at Tadworth. He served abroad in the R.A.M.C. during the 1914–18 war, part of the time in the Far East. This diversity of experience and training made him a practical general practitioner of real merit, and the people of Surrey are the poorer by his loss. Dr. Cundell married Miss Gold, who survives him with their son.—H. R.

Mr. GEORGE KEITH RIDDOCH was lost in the *Star Tiger* disaster on Jan. 30, 1948. He was the elder son of the late Dr. George Riddoch, and was educated at Rugby and Corpus Christi College, Cambridge, entering the London Hospital in 1938. He was awarded the Frederick Treves Prize in clinical surgery, and graduated in 1941. He married soon afterwards, while carrying out house appointments at Chase Farm Hospital, Enfield. In 1942 he joined the Navy, in which he served till 1946, for most of that time being overseas, at first in destroyers and later in a naval hospital. Riddoch returned to the London after the war and gained the F.R.C.S.Ed. He then went to the West Middlesex Hospital, and was still an assistant there at the time of his death. Keith Riddoch was an exceptional person. He had a first-class intellect and great practical ability, and was consequently already a surgeon at an age at which most show no more than promise. He had had considerable experience both in the Navy and afterwards, but it was not in his nature to follow one subject to the exclusion of all else, and his general training was sound and full. In his last year as a student, the first year of the war, organized teaching was replaced by a

series of resident appointments in "sector" hospitals, and of these he made full use. His bright and cheerful personality won him the friendship of all with whom he came in contact, and his forthrightness and ability won him their respect. He was a delightful companion, with many interests outside medicine, to all of which he applied himself with characteristic energy. Everything he did he did thoroughly. He read widely, he was a skilled carpenter, mended the family's shoes, and extended his knowledge of gardening to the production of a cellar of home-made wines—and these were but a few of the diverse interests to be found in a friend with a keen sense of humour and a constant kindliness. He knew how easy it is to become the slave of Medicine, and he was determined not to be so. He had achieved happiness, and those of us who knew him well, and knew particularly the complete happiness of his home with his wife and their son Graeme, see much more than the tragically early end of a career that must have been great—and will always be the happier for having known him.—J. O. W. D. and J. R. E.

Dr. CHARLES HAROLD WALKER MCCULLAGH died on Feb. 20 at the Queen Elizabeth Hospital, Birmingham, at the age of 74. He graduated at Trinity College, Dublin, in 1897, and proceeded M.D. in 1905. Four years later he took the Cambridge D.P.H. Dr. McCullagh came to Birmingham in 1927. He was a very successful general practitioner, and he was held in the highest esteem by his colleagues and patients alike. He had a keen sense of humour, and was exceptionally well read. A man of high ideals, his conscientious devotion to duty never failed. His heart was in the work to which he gave himself with unsparing energy until the day of his death. All his colleagues will miss him, and many will regret the loss of a good friend and will sympathize with his widow and two daughters.—W. McM.

Dr. NORTON BURROUGHS CLOWES, who died on Feb. 25, came from a line of well-known Norfolk doctors. His father and both his brothers had been students at Guy's Hospital, where he qualified in 1890. He served in the R.A.M.C. for the duration of the 1914–18 war. He was attached to the Colchester Military Hospital during the recent war, and worked at the Ministry of Pensions at intervals. Although suffering from the after-effects of operations for duodenal ulcer he carried on his work with pluck and determination to the end, and he was loved and respected by all who knew him. Dr. Clowes always hoped that he would die in harness and would "pass out quickly when his time came." Both of these wishes were granted. He married the youngest daughter of the late Sir William Robinson, who survives him with two married daughters.

Dr. RICHMOND STEEL died at his home in Southport on March 10. He graduated M.B., Ch.B. at Glasgow University in 1909, and even before the 1914–18 war he had begun to take an interest in radiology. A regimental medical officer during the war, on demobilization he decided to give up general practice, and he studied radiology in London, Paris, and Stockholm. He was also a pupil of Thurstan Holland, though to the latter's regret he did not proceed to the then recently created diploma. Settling in Southport, Dr. Steel specialized in *x*-ray work, and when a vacancy occurred he was elected radiologist to the Southport Infirmary. This post he filled for nineteen years. He served also the Ormskirk Hospital and the Southport E.M.S., now the Promenade, Hospital to within a few days of his death. Indeed, he had to be prevented from carrying on his examination of films while in bed. It was a great satisfaction to Steel that quite recently a very early carcinoma of the stomach which he detected was operated on successfully by Professor Wells. His films were then used to make slides for use on an American tour, since this was the earliest case that had been sent to Professor Wells. Quite apart from his professional skill, Steel was loved for his personal qualities. His broad humanitarianism, his flair for friendship, and his love of the society of his fellows endeared him to all. He delighted in organizing the social gatherings of the local Caledonian Society, of which he was secretary. Of sincere though unobtrusive religious conviction, during the recent war he supported his wife in an outstanding work for the dependants of men in the Forces. The loss of an only son, killed almost at the end of the fighting by a missile from a friendly plane, was borne with fortitude by both. To his widow the sympathy of all his colleagues and friends will be extended.—W. A. M.

Dr. Lina M. Potter writes: I would like to amplify a little the account (*Journal*, March 19, p. 503) of Dr. Ethel Vaughan-Sawyer's clinical class. Her patients adored her to the extent of tolerating whatever she prescribed. Mrs. Vaughan-Sawyer appreciated this herself and interpolated highly amusing asides for the benefit of the students.

Medico-Legal

ACTION FOR NEGLIGENCE IN DIAGNOSIS

Appeal Allowed

Mr. James Forbes Whiteford, an American citizen, was awarded £6,300 damages in an action[1] in July, 1948, in which he alleged negligence against Mr. John Bowman Hunter, M.S., F.R.C.S., and Dr. Seymour R. Gleed, a medical practitioner of Finchley. Mr. Justice Birkett dismissed the action against Dr. Gleed, holding that no negligence could be attributed to him. Mr. Hunter subsequently appealed against the decision of Mr. Justice Birkett, and Mr. Whiteford cross-appealed against the dismissal of Dr. Gleed from the case.

As has already been briefly noted,[2] Mr. Hunter's appeal was allowed and Mr. Whiteford's cross-appeal against the dismissal of his action against Dr. Gleed was dismissed. The judgment of the Court of Appeal was read by Lord Justice Asquith on March 21.

Summary of Judgment

Lord Justice Asquith said the action was one for damages for negligence and breach of contract brought by a patient against a well-known consultant surgeon and a general practitioner. On March 21, 1942, the plaintiff, a consulting engineer aged 65 or 66, consulted Dr. Gleed about certain bladder symptoms. On March 22 at Dr. Gleed's request Mr. Hunter saw the plaintiff at the Finchley War Memorial Hospital. He found the bladder distended and concluded that this was due to prostatic obstruction. He advised that the bladder should be drained at once and that removal of the prostate should be undertaken in about a fortnight. He then made a suprapubic puncture and inserted a drainage tube, which remained there till April 5, 1942.

On April 5 Mr. Hunter operated, intending to remove the prostate, which did not then feel very large. Up to this point the plaintiff had to concede that both doctors were right. Any negligence alleged must be proved in relation to April 5, when Mr. Hunter had embarked on the prostatectomy. Mr. Hunter opened the bladder. He then examined the interior of the bladder manually and visually with the help of a light. In the trigone area there was an indurated mass of tissue as large as the palm of a man's hand, reddish-grey in colour, and of an infiltrating, submucous character. He examined this by sight and touch for fifteen or twenty minutes and concluded that it was a cancer and an inoperable cancer. He also concluded that it was this mass, and not the prostate, which had given rise to the retention of urine. If his diagnosis was accurate the only surgical measure possible was excision of the whole bladder, and this he was satisfied the patient could not have borne. After consulting with Mrs. Whiteford, and on her advice, he informed the patient through Dr. Gleed that he was suffering from inoperable cancer and had only a matter of months to live.

Mr. Hunter never saw the plaintiff after April 5. Dr. Gleed attended him regularly up to Aug. 21. In July the patient's thighs and genitals became enormously swollen, which Dr. Gleed thought to be consistent with a spread through the lymphatic glands of the cancer. Mr. Whiteford sailed for New York on Aug. 21 and arrived on Sept. 6, being admitted immediately to the Memorial Hospital, 444, East 68th Street. On Sept. 8 Dr. Barringer examined the plaintiff, using a cystoscope furnished (as only about six cystoscopes in England were at that time) with a rongeur attachment, which allowed the surgeon to take a scraping from any suspected area of the bladder wall. Dr. Barringer saw several areas which, in view of Mr. Hunter's reported diagnosis, he suspected as cancer; a fairly large diverticulum in the base of the bladder; and a median prostate bar. He took a scraping from the suspected areas, and microscopical examination revealed no evidence of cancer, merely cystitis. On Sept. 15 Dr. Barringer operated and removed a large part of a "small fibrous" prostate; he also emptied the diverticulum of some soft calcareous material and removed the drainage tube. A specimen of the prostate was later examined and showed "benign prostatic hypertrophy." After a long period of convalescence further portions of the

prostate were removed in 1943 through the urethra, and in 1944 the plaintiff returned to England and later issued the writ in the present action.

Mistaken Diagnosis

Continuing, his Lordship said that these facts were undisputed and it was patent that Mr. Hunter was mistaken in his diagnosis of cancer on April 5. The question was whether in making this mistake he was guilty of negligence. No doctor was liable in negligence by reason only that he had made a mistaken diagnosis. On the other hand, as Lord Justice Scott said[3] in *Mahon* v. *Osborne*, speaking of professional men in general: "If he professes an art he must be reasonably skilled in it. . . . He must also be careful, but the standard is not insurance against accidental slips. It is such a degree of care as a normally skilful member of the profession may reasonably be expected to exercise in the actual circumstances of the case in question. It is not every slip or mistake which imports negligence." His Lordship also quoted Lord Justice Maugham,[4] as he then was: "A defendant charged with negligence can clear himself if he shows he acted in accord with the general approved practice."

In the statement of claim the negligence complained of against Mr. Hunter was limited to March 22 and April 5. As regards March 22, the findings of the learned Judge negatived negligence on the part of either defendant. They affirmed negligence on the part of Mr. Hunter, however, on April 5, and in argument and in the judgment overwhelming emphasis was laid on the allegation that Mr. Hunter "failed to take steps to check or verify the true nature of the alleged cancerous growth by any or any sufficient cystoscopic examination or suprapubic examination at the time of the operation or pathological examination or by taking a section of the growth or otherwise."

The finding of negligence was based essentially on Mr. Hunter's omission to perform cystoscopy or to undertake biopsy. His Lordship reviewed again the expert evidence given by Mr. Ogier Ward and Mr. Julian Taylor, and said that on the question of cystoscopy it appeared to be decisive that once it was decided to open the bladder on April 5 cystoscopy was entirely unnecessary. He regretted that this point had not been put more clearly to Dr. Barringer by counsel, who were labouring under the disadvantage of examining a witness on commission. Plaintiff's counsel had quoted passages from the 15th edition of *Rose and Carless*, of which Mr. Hunter was joint editor, commending the general use of the cystoscope for the diagnosis of vesical conditions, and argued that because these passages, or some of them, did not expressly qualify or limit this commendation the cystoscope should be employed in all cases. The answer was surely that some limitations were too obvious to require expression. "If you are in any case going to observe the inside of the bladder by other (and one would have supposed, since they include touch as well as sight, more effective) means, it cannot have been meant that you must also in that event resort to the cystoscope." Accordingly Mr. Justice Birkett's finding under this head could not be supported. The question was not one of Dr. Barringer's good faith or credibility, it was a question of the true interpretation of Dr. Barringer's evidence, and in the circumstances of this case the trial Judge did not enjoy any advantage denied to the Court of Appeal.

Biopsy

It was argued for the plaintiff that a biopsy should be performed in every case where the presence or absence of cancer was in question. Mr. Hunter was pressed on this point, and had said that after fifteen or twenty minutes' inspection and handling of the area he had arrived, on the evidence of his senses (fortified by long clinical experience), at a clear conviction that the condition was malignant. In this particular case Mr. Hunter gave three reasons why he did not resort to biopsy: first, that he would have had to cut so deep that there would be a risk of perforation of the bladder wall; secondly, that the incision must necessarily leave an unhealing ulcer which would make the rest of the plaintiff's life an utter misery, adding avoidable to necessary suffering; thirdly, that the result of microscopical examination might in any case be indecisive, since where a suspected area had ill-defined frontiers one could not be certain that the section had been taken from the right part of it. An attempt was made to put these three points to Dr. Barringer.

(Q) Is it not true that taking a specimen from the bladder involves some danger of perforating the bladder or causing an ulceration?

(A) I have never seen this procedure cause a perforation of the bladder and never have seen it cause any observable ulceration.

(Q) But it could, could it not?

(A) Yes, anything could happen in careless and crude hands.

Mr. Justice Birkett was clearly impressed with this forthright assertion. Nevertheless, Dr. Barringer's evidence, if taken in the sense ascribed to it by the learned Judge as applying to the question of biopsy, was in such flat conflict with the whole of the English evidence as to permit inquiry whether it would not bear a different interpretation. In the view of their Lordships Dr. Barringer was referring not to biopsy in general but to what he subsequently did in September, 1942. His mind was directed to the condition he himself had seen and the procedure he had adopted. This consisted not in taking a deep section with a knife from the open bladder but in taking a superficial scraping with the rongeur attachment of his cystoscope. Dr. Barringer's evidence was again not unambiguous when he said at one point that Mr. Hunter should have used all three methods of diagnosis—cystoscopy, biopsy, and examination of the open bladder—while later he appeared to say that it was possible for Mr. Hunter to make a diagnosis "with all reasonable accuracy" by examination of the open bladder alone. There were also omissions in Dr. Barringer's evidence, notably that he was not asked what he would have done if confronted with what Mr. Hunter found—something quite different from what Dr. Barringer found later. Nor again was it put to Dr. Barringer that cystoscopy would be superfluous in a case where the bladder was to be opened in any event as opposed to a case where the surgeon wished to determine in advance of operation whether it was necessary to open the bladder or not.

For these reasons it appeared that the learned Judge was mistaken in according to Dr. Barringer's evidence the decisive weight which in the view of the Court of Appeal he had attributed to it. His finding that it was negligent on the part of Mr. Hunter not to carry out a biopsy could not therefore be supported. Without that finding and a like finding in regard to cystoscopy the bottom fell out of the plaintiff's case and the appeal must therefore succeed.

Cross-appeal against Dr. Gleed

The cross-appeal against Dr. Gleed was then considered. On March 22 Dr. Gleed had tentatively arrived at a correct diagnosis. Subsequently he brought in a consultant to check his diagnosis. As to the diagnosis made on April 5, Mr. Hunter had said: "It was the approved practice in the medical profession for the consultant surgeon to accept full responsibility for the diagnosis," and that he accepted that responsibility. It was inherent in the logic of the position that this should be so. A consultant was called in only when the difficulties of the diagnosis were assumed to be such that the experience and qualifications of a general practitioner were unequal to them. On this assumption clearly from that time onwards the opinion of the consultant, and his opinion only, was that on which the patient relied. In these circumstances there was no doubt whatever that the cross-appeal, which was not strongly pressed, should be dismissed.

Judgment was then entered for the defendants with costs. Leave was given to appeal to the House of Lords.

Mr. C. R. Havers, K.C., and Mr. Henry C. Dickens, instructed by Messrs. Hempsons on behalf of the Medical Defence Union, appeared for the defendants; Mr. Richard O'Sullivan, K.C., and Mr. Robert Fortune, instructed by Messrs. Billinghurst, Wood and Pope, for the plaintiff.

[1] *British Medical Journal*, 1948, **2**, 537.
[2] Ibid., 1949, **1**, 549.
[3] *Mahon* v. *Osborne*, 1939, 2 K.B. 31.
[4] *Marshall* v. *Lindsey County Council*, 1935, 1 K.B. 516.

Universities and Colleges

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been approved at the examinations indicated:

M.D.—R. M. Peet, E. N. O. Sodeinde.

M.A.O.—G. B. Gibson, M. A. Majekodunmi.

FINAL MEDICAL EXAMINATION.—*Midwifery (B.A.O.)*: *S. B. Sloan, *D. W. Beckett, *Eleanor B. Outon, *L. J. Clein, *C. F. Ross, *R. J. M. Fry, *Stephanie Seville, *W. D. H. Troughton, *R. P. A. Coffey, *W. P. C. Deely, *K. C. Finkel, *W. Pappenheim, *R. S. Young, *W. G. T. Bell, *R. S. Crone, *B. B. Fazackerley, J. H. Ashmore, F. G. O. Burrows, S. M. Laird, T. T. E. Michael, Frances E. Russell, Evelyn Browne, D. W. Kyle, S. C. Blake, E. G. England, Wilhelmina Hutchinson, Beatrice P. Karmel, L. R. Robinson, M. D. M. Staunton, F. A. Walkey, C. D. Wray, Audrey M. Franklin, O. H. Killen, W. D. McNaul, Thelma H. W. Morks, R. J. O'Reilly, A. A. Sweeney, Dorothy J. Cartmill, Agnes C. Good, E. V. Page, Kathleen C. Rogers, E. R. D. Williamson, Anne L. J. Cusack, R. C. Gray, Sheilagh M. McHugh, Gwendoline G. L. Poots, R. N. Siberry, J. P. Nixon, Mildred Vilensky, Reva Berstock, E. B. McHugh, E. A. Otchere, W. D. H. Powell, B. S. Telford, Joan I. Buchanan, J. C. McLean, Ruth M. Perrott, Margaret E. E. Ellis, D. Miller,

D.G.O.—A. Aziz, U. Bardolai, H. K. Brar, N. M. Damle, D. S. Desai, W. G. Dixon, H. Kessel, M. W. Livingston, A. Mansi, A. S. Murad, Z. Nasiruddin, W. F. Rassam, I. M. Shenouda, Sarah T. Thomas.

* Second Class Honours.

UNIVERSITY OF DURHAM

Edgar Alexander Pask, M.D., D.A., has been appointed Professor of Anaesthetics at King's College, Newcastle-upon-Tyne.

UNIVERSITY OF LONDON

James Livingstone Livingstone, M.D., F.R.C.P., has been appointed a Fellow of King's College.

A Special University Lecture on "Hypersensitivity in Disease" will be delivered by Professor J. H. Biggart, M.D., Musgrave Professor of Pathology in Queen's University, Belfast, at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Friday, April 8, at 5.30 p.m., with Professor Wilson Smith, M.D., F.R.S., in the chair. The lecture is addressed to students of the University and to others interested in the subject and admission is free, without ticket.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examination indicated:

D.P.M.—*Part I*: L. Couper, R. Halliday, R. McDonald, J. R. M. Mackie, H. J. B. Miller, P. H. Mitchell, Margaret I. Platt.

UNIVERSITY OF LEEDS

At a meeting of the Council of the University on March 16 R. J. Still, M.B., B.Chir., was appointed University Medical Officer from May 1.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The following lectures will be delivered at the College (Lincoln's Inn Fields, London, W.C.) at 5 p.m. each day: April 1, Erasmus Wilson Demonstration by Mr. Guy Blackburn, "Diseases of the Thyroid Gland"; April 28, Hunterian Lecture by Professor Charles F. M. Saint (Capetown), "Stomatodaeal Ruminations, Clinical and Non-clinical"; April 29, Hunterian Lecture by Professor R. I. Harris (Toronto), "Spondylolisthesis." The lectures are open to those attending courses at the College and to all other medical practitioners, dental surgeons, and advanced students.

The Services

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held on Friday, April 22, at 3 p.m., at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W., to elect six directors of the fund.

DEATHS IN THE SERVICES

Major Robert William Henry Jackson, R.A.M.C. (retd.), died at his home in Caernarvon on Feb. 20. He was born in Dublin in 1864, the son of Surgeon-General Sir Robert W. Jackson, F.R.C.S.I. He graduated M.B., B.Ch., B.A.O. in 1897 at Trinity College, Dublin, obtaining the D.P.H. in the same year. He proceeded M.D. in 1892. Major Jackson was chairman of the Caernarvonshire and Anglesey Division of the B.M.A. for three years in succession during the last war, and represented the Division in 1939, 1941, and 1942 at annual representative meetings. Two years after qualifying he entered the Army at the top of the examination list, and was attached to the second battalion Coldstream Guards. He was later posted to India, where he did excellent work in public health and hygiene as a special officer for the plague departments in Bombay and Calcutta. He saw active service on the North-west Frontier and in the Boer War. In 1907 he volunteered for duty at Kingston, Jamaica, acting as senior medical officer and special health officer, and was highly commended for his services. Major Jackson retired from the Army in 1910, but was again put on the active list during the 1914–18 war, serving as senior medical officer of the Portland Defences, Weymouth, and on hospital ships and troop transports. After the first world war he was placed in charge of the Military Hospital, Clonmel, Ireland. Although 75 years of age at the outbreak of war in 1939, he was not content to remain inactive, and immediately volunteered for duty as medical officer of the ninth battalion R.W.F. camp at Caernarvon, which post he relinquished to act as ship surgeon on the M.V. *Glenapp*, carrying munitions via the Panama Canal and the Dutch East Indies to Singapore. The vessel had to leave this port hurriedly for Australia, returning home via the Cape, owing to the Japanese capture of Singapore. Major Jackson was elected an honorary life member of the British Red Cross Society and the Venerable Order of the Hospital of St. John of Jerusalem, and was the county controller for Caernarvonshire for the Red Cross Society.—I. M. W.

Medical Notes in Parliament

ANALGESIA IN CHILDBIRTH

Mr. BEVAN on March 24 furnished the following information to Lady TWEEDSMUIR. It relates to England and Wales.

Year (1)	Number of Domiciliary Confinements at which Midwives were in Charge (2)	Number of Domiciliary Confinements where Gas and Air Analgesia was Administered by Midwives (3)	Percentage of Col. (3) to Col. (2) (4)
1938	289,035	1,175	0·4
1939	285,024	1,029	0·4
1940	284,227	1,545	0·5
1941	268,905	1,783	0·7
1942	274,148	1,743	0·6
1943	269,579	3,207	1·2
1944	281,769	5,102	1·8
1945	245,237	7,262	3·0
1946	298,019	20,507	6·9
1947	327,245	43,683	13·3
1948	Information not yet available		

In addition to the domiciliary confinements where a midwife was in charge there were a large number of domiciliary confinements where a doctor was in charge. These confinements numbered 95,543 in 1946 and 96,937 in 1947. Although figures were not available it was known that analgesia or anaesthesia was given in a high proportion of these doctors' cases.

Mr. Bevan further stated that analgesia was being used in the domiciliary midwifery service of 134 of the 145 county and county borough councils. Individual action was being taken with the councils of the counties and county boroughs in which it was not yet being provided.

In reply to another question Mr. Bevan said that in Leeds 100% of the domiciliary midwives employed by the city council and 65% of the hospital midwives were trained in the use of analgesia. In the six months of 1948 in which the National Health Service was in operation 35% of the domiciliary cases attended by the council's midwives had analgesia.

Figures for Scotland

Colonel GOMME-DUNCAN asked on March 22 in how many cases in Scotland was analgesia administered by domiciliary midwives or nurses trained in midwifery in the years 1938, 1944, 1947, and 1948 respectively.

Mr. WOODBURN replied that there could not have been any cases in 1938 and 1944, because it was only in July, 1946, that the Central Midwives Board for Scotland authorized the administration of analgesia by midwives. In 1947 there were 120 cases and in 1948, according to preliminary returns, about 800. Mr. Woodburn further stated that in Scotland training in analgesia was being given to certified midwives at the rate of almost 250 a year, and to all student midwives numbering about 600 a year. He hoped that by the end of 1950 over three-quarters of the midwives then practising in Scotland would have had this training.

Examination of National Service Men

Replying on March 15 to a question by Mr. GRANVILLE SHARP on the medical examination of men for National Service, Mr. ISAACS said there had been no general raising of the medical standards, but a revised system of medical classification, known as the Pulheems system, which was introduced in June, 1948, resulted in a more accurate assessment of a man's physical and mental fitness for service. Certain improvements in the methods of medical examination were also introduced towards the end of 1948. The effect of these changes could not yet be fully assessed, but the latest available figures showed a slight increase in the proportion of men rejected as unfit for service. Two major changes had been made in the medical examination. Mass radiography was undertaken and the examination for ear troubles was more intensive. At the moment the percentage of rejections was 15.9 against 13.5. The increase was mainly due to the innovations which he had mentioned.

"Dogger Bank Itch"

Mr. STEELE, replying on March 15 to Dr. BARNETT STROSS, said he did not know if a ruling had been given on whether fishermen in the North Sea who developed dermatitis from irritation by the sea chervil were entitled to workmen's compensation. Interpretation of the regulations was a matter for the appropriate authorities under the Industrial Injuries Act.

This type of dermatitis was the subject of an annotation in our issue of Feb. 26 (p. 358).

Handicapped Persons' Welfare—Advisory Council.—Lord Rushcliffe will be chairman of the Advisory Council on the Welfare of Handicapped Persons appointed under the National Assistance Act. The only medical member of the Council is Dr. Fraser Brockington, who is medical officer of health of West Riding County Council. The council will advise the Minister on the development of welfare services for the blind, deaf and dumb, and cripples.

EPIDEMIOLOGICAL NOTES

Influenza

There were 360 deaths in the great towns in the week ended March 19, compared with 321 in the previous week. There were small increases in the West Riding towns but the principal increases were in the Midlands; Birmingham, for example, had 37 deaths against 20 in the previous week. In Greater London a small decrease from 83 to 71 deaths was noted.

Discussion of Table

In *England and Wales* the only notable change in the trends of infectious diseases was a decrease of 1,314 in the notifications of measles. There were decreases also in the incidence of whooping-cough 32, dysentery 16, and scarlet fever 11.

The largest falls in the notifications of measles were Yorkshire West Riding 396, Essex 281, Lancashire 219, Somerset 203, Southampton 188, Nottinghamshire 116, and Leicestershire 109; the largest rises in incidence were Warwickshire 92, Surrey 79, and Middlesex 58.

Notifications of diphtheria fell by 7 in London and in Lancashire. The only appreciable change in the incidence of scarlet fever was a decrease of 46 in Lancashire. The notifications of whooping-cough fell by 33 in Yorkshire West Riding.

Of the 49 cases of dysentery 19 were notified in Lancashire (Liverpool C.B. 8).

In *Scotland*, apart from decreases in the incidence of acute primary pneumonia 37 and whooping-cough 16, the notifications of infectious diseases remained practically unchanged. Almost two-thirds of the cases of diphtheria and dysentery were notified in Glasgow.

In *Eire* there were decreases in the notifications of whooping-cough 43, measles 38, and diarrhoea and enteritis 11. The largest of the local outbreaks during the week were 19 cases of measles in Donegal, Stranorlar R.D., and 17 cases of scarlet fever in Kilkenny, Kilkenny U.D.

In *Northern Ireland* the notifications of measles declined by 32, while a rise of 22 was recorded in the incidence of whooping-cough. The largest fall in the notifications of measles was 21 in Antrim county, and the largest increases in the notifications of whooping-cough were Belfast C.B. 15 and Tyrone county 14.

Week Ending March 19

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,209, whooping-cough 2,790, diphtheria 114, measles 16,275, acute pneumonia 1,524, cerebrospinal fever 57, acute poliomyelitis 18, dysentery 35, paratyphoid 2, and typhoid 3.

No. 10

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 12.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949 (a)	(b)	(c)	(d)	(e)	1948 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	35	4	16	3	1	55	5	25	1	1
Deaths		1	—				—	—		
Diphtheria	101	6	32	1	5	173	19	50	13	1
Deaths	1	—	—	—	—	2	1	—	—	—
Dysentery	49	3	20	—	1	213	23	72	2	—
Deaths				—	—				1	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	—	—	-
Deaths		1					—			
Erysipelas			33	8	6			40	4	3
Deaths		—					1			
Infective enteritis or diarrhoea under 2 years				38					36	
Deaths	50	2	5	1	2	50	6	11	2	2
Measles*	17,305	1034	164	137	182	8,449	1257	614	78	39
Deaths†			—	—	—			2	1	
Ophthalmia neonatorum	34	3	8	—	—	42	3	13	—	-
Deaths										
Paratyphoid fever	3	—	2(B)	—	—	3	—	1(B)	—	-
Deaths	—	—	—	—	—	—	—	—	—	-
Pneumonia, influenzal	1,514	78	22	13	12	933	49	4	6	1
Deaths (from influenza)‡	321	39	7	1	4	31	8	—	—	—
Pneumonia, primary			224	42				320	38	
Deaths	527	83		13	22	293	71		6	
Polio-encephalitis, acute	3	—				—	—			
Deaths										
Poliomyelitis, acute	17	2	1	1	—	20	4	2	4	-
Deaths§	1	—				1	—			
Puerperal fever		—	10				2	10		-
Deaths										
Puerperal pyrexia‖	95	5	2	2	1	120	9	7	—	-
Deaths		—					—			
Relapsing fever	—	—			—	—	—			-
Deaths										
Scarlet fever	1,178	69	186	102	22	2,027	123	319	50	4
Deaths†			—	—	—			—	—	-
Smallpox	—	—	—	—	—	—	—	—	—	-
Deaths				—	—				—	-
Typhoid fever	1	—	—	2	1	4	1	—	3	1
Deaths	1	1	—	—	—			—	—	
Typhus fever	—	—	—	—	—	—	—	—	—	-
Deaths				—	—				—	-
Whooping-cough*	2,621	189	231	63	88	3,418	236	49	41	15
Deaths	15	—	2	1	—	15	2	2	—	-
Deaths (0–1 year)	349	38	42	34	13	380	55	61	23	1
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	7,206	1116	694	241	192	5,581	988	680	285	14
Annual death rate (per 1,000 persons living)			13·9	14·9				13·7	12·8	
Live births	7,963	1311	969	452	249	8,738	1419	986	463	21
Annual rate per 1,000 persons living			19·4	28·0				19·9	29·0	
Stillbirths	204	19	24			240	23	36		
Rate per 1,000 total births (including stillborn)			24					35		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

Medical News

Chloromycetin Synthesized

It has been announced by Parke Davis and Company that the antibiotic chloromycetin (to which reference has recently been made in two leading articles—Aug. 28, 1948, p. 428, and Dec. 25, 1948, p. 1113) has been produced artificially in their research laboratories in the U.S.A. A copy of the structural formula was handed to Sir Alexander Fleming in London on March 30. The substance, which can be manufactured on a commercial scale, has been tested clinically and found effective in a number of diseases. The formula is as follows: (*l*)-ψ-1 *p*-nitrophenyl-2-dichloroacetamidopropane-1 : 3 diol.

Imperial Cancer Research Fund

At a meeting of the Imperial Cancer Research Fund held on March 8 Dr. James Craigie was appointed General Superintendent of Investigations and Director of the Central Laboratory of the Fund from August, 1949, in succession to Professor W. E. Gye. Sir Henry Dale was elected a Life Governor of the Fund in recognition of his distinguished services as a member of council.

Chinese Medical Visitor

Dr. Li Fang-Yung, Professor of Public Hygiene in the National Kweiyang Medical College, who has been working in the U.S.A., arrived in Britain on March 15 for a month's visit under the auspices of the British Council before returning to China. He is studying the undergraduate teaching of preventive medicine and public health. After spending a week at the London School of Hygiene and Tropical Medicine and then visiting the Woolwich Health Department, the Department of Bacteriology at the London Hospital, and the Ministry of Health, he goes on April 3 to Edinburgh to spend two weeks in the Department of Social Hygiene of Edinburgh University. Dr. Li carried out a rural health experiment as technical expert to the Mass Education Movement at Ting Hsien between 1932 and 1937. He was Director of the Public Health Division of the Provincial Health Department of Kiansi from 1937 to 1939, and in 1945 was appointed Professor of Public Hygiene in the National Medical College.

Professor Haddow in Italy

Professor Alexander Haddow, Professor of Experimental Pathology in the University of London and Director of the Chester Beatty Research Institute at the Royal Cancer Hospital, Fulham Road, left London on March 25 for a lecture tour in Italy under the auspices of the British Council. He is speaking at Milan, Bologna, Florence, Rome, and Turin on "Recent Advances in the Chemotherapy of Cancer" and "Mode of Action of the Nitrogen Mustards—a New Working Hypothesis and Its Possible Relation to Carcinogenesis." His lectures are being arranged with the co-operation of Professor Rondoni, the leading cancerologist of Milan, and of Professor Bastanielli, head of the Cancer Institute in Rome.

The Late Alderman William Hyde

A memorial window was dedicated to the memory of the late Alderman William Hyde, C.B.E., J.P. in the parish church at Toddington, Beds, on Dec. 11, 1948. Alderman Hyde, who died in 1945, was the first secretary of the Nuffield Provincial Hospitals Trust, which was founded in 1939. He had a very wide knowledge of medical services, and at the time of his death Sir Farquhar Buzzard wrote of him: "Without any professional training or background he became an acknowledged authority in many spheres of voluntary and benevolent enterprises; he was equally at home in National Health Service, in social insurance, in friendly and approved societies, and was recognized as the pioneer of provident associations, which he developed throughout the country. Having always been interested in hospitals, both in the voluntary and local government fields, he naturally and appropriately was chosen by the Nuffield Provincial Hospitals Trust as its leading active officer, thus becoming mainly responsible for that body's efforts to promote the regional co-ordination of health and hospital services."

Australian Postgraduate Education

A Federation to be known as the Australian Postgraduate Federation in Medicine has been formed with the object of encouraging and advancing postgraduate medical education, work, and research in Australia. In addition, the Federation will deal with matters common to more than one Postgraduate Committee, and particularly with the arrangements for visits of teachers to Australia. The members of the Federation are the Melbourne Permanent Postgraduate Committee, the Postgraduate Committee in Medicine in the University of Sydney, the Postgraduate Committee in Medicine of the University of Adelaide, the Postgraduate Medical Education Committee of the University of Queensland, the Western Australian Postgraduate Committee (British Medical Association), and the Tasmanian Postgraduate Committee in Medicine. Provision has been made to admit to membership organizations from New Zealand or elsewhere on certain conditions. A president, vice-president, and an executive committee will be appointed each year, and the executive committee will be elected from persons nominated by the Postgraduate Committee of the State chosen for this purpose by the Federation. The Postgraduate Committee in Medicine in the University of Sydney was selected to provide the first executive. The meetings of the Federation will usually be arranged at times when inter-State meetings of medical organizations are held and will thus ordinarily take place at times of the annual meetings of the Royal Colleges and during Congresses of the British Medical Association.

Hunterian Society

The council of the Hunterian Society has chosen "The Treatment of Varicose Veins and Their Complications" as the subject for the 1949 competition for the society's gold medal which is awarded for the best essay submitted by any general practitioner. Further details may be obtained from the honorary secretary of the society, Mr. J. C. Ainsworth-Davis, 48, Wimpole Street, London, W.1, by whom essays must be received by Dec. 31.

Influenza Centre

An Influenza Information Centre has been established in the United States at Bethesda, Maryland, to serve as headquarters for American participation in the World Health Organization study of influenza. The centre will be concerned with the identification of influenza virus from outbreaks in the U.S.A., and will assess the usefulness of including new strains in commercial vaccines. It will also serve as a liaison office between American laboratories and the International Influenza Centre, which was established at the National Institute for Medical Research in London in 1947.

Royal Sanitary Institute Prizes

The Council of the Royal Sanitary Institute have announced particulars of the prize essay competitions for 1949. Three prizes are offered: the John Edward Worth Prize of £40 for an essay on practical improvements of appliances or inventions used or proposed to be used in or about dwelling-houses; the John S. Owens Prize of £15 for an essay on the ventilation of dwellings and its effect on human health; and the Henry Saxon Snell Prize of 50 guineas for an essay describing suggested improvements in the construction or adaptation of sanitary appliances. Intending competitors should apply to the Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1, for a copy of the general conditions.

Wills

Dr. Alexander Wilson Gill, of Barlaston, Staffs, left £41,453. Dr. Charles Braxton Mooring Aldredge, of Bournemouth, left £56,417; Dr. Edward Augustus Bullmore, formerly of Wisbech St. Peter, Cambs, £36,871; Dr. Robert Warren Merrick, of South Croydon, £38,734; and Dr. Herbert Edmund Vincent, of Reigate, £4,556.

COMING EVENTS

Royal Microscopical Society

A special meeting of all sections of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, London, W.C., on Wednesday, April 6, at 4.30 for 5 p.m., when Dr. J. A. Murray, F.R.S., a past-president of the society, will be admitted to the Honorary Fellowship. Demonstrations will be given by Mr. H. G. Crabtree on "Liver Tumours Induced by Azo-dyes," by Dr. E. Vasquez Lopes on "Nerve Endings in the Posterior Pituitary," and by Mr. J. Smiles on "Recent Applications of Phase-contrast Microscopy to Biological Research." Short communications will be presented by Dr. G. M. Findlay on "Primary Carcinoma of the Liver," by Dr. L. Foulds on "Vesical Tumours Induced in Mice by 2-acetylamino-fluorine," by Mr. E. Horning, D.Sc., on "Lung Tumours Induced by a New Technique," and by Dr. F. R. Selbie on "Malignant Transformation." The meeting will be followed by a dinner at the Holborn Restaurant at 7 for 7.30 p.m.

Regional Consultants Committee for East Anglia

A meeting of the Regional Committee of Consultants and Specialists for East Anglia will be held at Rutland Arms Hotel, Newmarket, on Monday, April 11, at 8.15 p.m., when, among other things, the proposed terms and conditions of service of hospital medical and dental staff will be considered. The meeting will be preceded by dinner at 7.15 p.m.

Bristol Medical Reunion Dinner

The Bristol Medical Reunion Dinner will be held at the Victoria Rooms, Bristol, on Wednesday, April 20, 1949, at 7.30 p.m. and not on Saturday, April 30, as was stated in our issue of March 5 (p. 419). Particulars may be obtained from Dr. Richard Clarke, Harley Lodge, Clifton Down, Clifton, Bristol, 8

Society of Anaesthetists of the South-West Metropolitan Region

The Society of Anaesthetists of the South-West Metropolitan Region has arranged a meeting to be held at St. Helier Hospital, Carshalton, Surrey, on Saturday, April 23. Anaesthetists from other areas will be welcome, and those wishing to attend should communicate with the honorary secretary, Dr. W. Alexander Low, Department of Anaesthetics, St. Thomas's Hospital, London, S.E.1, not later than April 4.

University of Leeds Postgraduate Committee

A refresher course for general practitioners will be held at the University of Leeds during the two weeks beginning May 2. The fee for the course is £10 10s., or £5 5s. for one week. Applications for places in the course, and for particulars of the financial assistance available to (*a*) demobilized general practitioners within one year of release from the Forces, and to (*b*) doctors engaged in practice in the National Health Service, should be made to the senior administrative Officer, School of Medicine, Leeds, 2, it being stated whether the applicant falls into class (*a*) or class (*b*), or whether he proposes to attend at his own expense.

Spanish Paediatric Congress

The 7th National Congress of Paediatrics will be held at Seville on May 9–14 under the presidency of Professor González-Meneses Jimenez and Dr. Carlos Sainz de los Terreros. Information may be obtained from the Secretary-General, Dr. Morales y González, Bailén, 49, Sevilla.

APPOINTMENTS

BAILEY, NEIL, M.B., Ch.B., Senior Resident Medical Officer, Fulham Maternity Hospital.

KEITH, G. ELIZABETH, M.B., B.S., F.R.C.S.Ed., M.R.C.O.G., Honorary Gynaecologist, Hôpital et Dispensaire Français, and Consultant Obstetrician, Wimbledon Antenatal Clinics.

MITCHELL, ROBERT, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, County Borough of Bury, Lancashire.

SOCIETIES AND LECTURES

Friday

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—April 1, 5 p.m., "*Diseases of the Thyroid Gland*," Erasmus Wilson Demonstration by Mr. Guy Blackburn.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—At Whipps Cross Hospital, Leytonstone, E., April 1, 8.30 p.m., "*Emergency Gynaecology*," by Mr. A. Galletly.

Tuesday

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, London, S.W.—April 5, 5 p.m., "*Problems of Ageing and Chronic Sickness*," Lumleian Lecture by Dr. A. P. Thomson.

Wednesday

HARVEIAN SOCIETY OF LONDON.—At 26, Portland Place, London, W., April 6, 8.15 p.m., "*Cineradiography*," by Dr. Russell J. Reynolds.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—April 6, 12 noon, "*The Larynx: Tuberculosis, Lupus, Syphilis*," by Mr. J. D. McLaggan.

LONDON COUNTY MEDICAL SOCIETY.—At St. James's Hospital, Ouseley Road, Balham, S.W., April 6, 3 p.m., clinical meeting.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—At 28, Portland Place, London, W., April 6, 3.30 p.m., "*The Growing Family under Modern Home Conditions*," by Dr. L. G. Housden.

ROYAL MICROSCOPICAL SOCIETY.—(1) At B.M.A. House Tavistock Square, London, W.C., April 6, 4.30 p.m. for 5 p.m., Special meeting of all sections. Demonstrations: "*Liver Tumours Induced by Azo-dyes*," by H. G. Crabtree, M.Sc., A.R.I.C., "*Nerve Endings in the Posterior Pituitary*," by Dr. E. Vasquez Lopes, "*Recent Applications of Phase-Contrast Microscopy to Biological Research*," by J. Smiles, A.R.C.S., F.R.M.S. Short communications: "*Primary Carcinoma of the Liver*," by Dr. G. M. Findlay, "*Vesical Tumours Induced in Mice by 2-Acetylamino-Fluorene*," by Dr. L. Foulds, "*Lung Tumours Induced by a New Technique*," by E. W. Horning, D.Sc., "*Malignant Transformation*," by F. R. Selbie, Ph.D. (2) At Holborn Restaurant, London, W.C., 7 p.m. for 7.30 p.m., Dinner.

ROYAL SANITARY INSTITUTE.—At 90, Buckingham Palace Road, London, S.W., April 6, 2.30 p.m., "*The Disinfection of Ice-cream-Serving Equipment*," (*a*) "*The Problem*," by Dr. J. G. Davies, Ph.D., D.Sc., F.R.I.C.; (*b*) "*The Use of Quaternary Ammonium Compounds*," by Mr. J. C. L. Resuggan, F.R.I.C; (*c*) "*Technique and Results*," by Miss Roberta Ive.

SOCIETY OF PUBLIC ANALYSTS.—At Gas Industry House, 1, Grosvenor Place, London, S.W., April 6, 7 p.m., Ordinary meeting. Papers will be presented and discussed.

Thursday

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, London, S.W.—April 7, 5 p.m., "*Problems of Ageing and Chronic Sickness*," Lumleian Lecture by Dr. A. P. Thomson.

ROYAL PHOTOGRAPHIC SOCIETY: MEDICAL GROUP, 16, Prince's Gate, London, S.W.—April 7, 7 p.m., "*Group Hospital Medical Photography*," by Mr. J. F. V. Larway.

Friday

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., April 8, 5.30 p.m., "*Hypersensitivity in Disease*," by Professor J. H. Biggart.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—At Miller Hospital, Greenwich High Road, London, S.E., April 8, 8.30 p.m., Presidential address by Dr. J. M. Loftus.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Chacia.—On Feb. 5, 1949, to Joan (née Tanner), M.B., B.S., wife of Edmund W. Chacia, a daughter—Helen Joan Barbara.

Finlayson.—On March 21, 1949, at Falkirk and District Royal Infirmary, to Dr. and Mrs. Finlayson, 8, Rosehall Terrace, Falkirk, a son.

Hamilton.—On March 9, 1949, at the Simpson Memorial Pavilion, Edinburgh Royal Infirmary, to Dr. Gwyneth Maclean Hamilton, wife of Lieutenant J. R. Hamilton, a son.

Mather.—On March 20, 1949, at York, to Dr. Maud Mather (née Buchanan), wife of Dr. John S. Mather, Shipton Thorpe, York, a daughter.

Miller.—On March 21, 1949, at Fernwood House, Newcastle-upon-Tyne, to Dr. Eileen Miller (née Baird), wife of Dr. Henry G. Miller, a son.

DEATHS

Carrey.—On March 5, 1949, John Carrey, M.B., B.Ch., B.Sc., Lieutenant-Colonel, I.M.S., retired, of Beckett Lodge, Beckett Road, Worcester.

Carter.—Joseph Hamilton Carter, M.B., Ch.B.Edin., of Trinidad, B.W.I.

Craig.—On March 23, 1949, Charles Hawkins Craig, M.B., Ch.B.Ed., of 1 Station Road, Cheadle Hulme, Stockport, aged 78.

Crawford.—On March 14, 1949, John Martin Maynard Crawford, O.B.E., F.R.C.S.I., Lieutenant-Colonel, R.A.M.C., retired.

Croxford.—On March 15, 1949, Roland John Croxford, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of Queen's Park, Manchester.

Davenport.—On March 22, 1949, at Middlesex Hospital, London, W., Percival Arthur Clive Davenport, M.B., Ch.M., Lieutenant-Colonel, I.M.S., retired, of 26, Chepstow Villas, London, W.

Dobbin.—On March 13, 1949, at 500, Caledonian Road, London, N., Wilfrid Arthur Edwin Dobbin, M.R.C.S., L.R.C.P.

Grinling.—On March 14, 1949, at 22, North Quadrant, Sheffield, Philip Newman Grinling, M.B., B.S., aged 41.

Hamilton.—On March 17, 1949, at Adelaide, South Australia, Charles Wolf Hamilton, M.D.

Hay.—On March 9, 1949, Alexander Robertson Forrest Hay, M.B., Ch.B., of 1, Golden Hillock Road, Birmingham, aged 66.

Hayward.—On March 12, 1949, at Hilcot, Wilton, Wiltshire, John Arthur Hayward, M.D., M.R.C.P., F.R.C.S., aged 83.

Hope.—On March 21, 1949, at 9, Grove Avenue, Gosforth, Newcastle-upon-Tyne, M. Edith Hope, M.R.C.S., L.R.C.P., D.M.R.E., of 62, Wimpole Street, London, W.

Henry.—On March 15, 1949, at Ennerdale, Westrow Road, Southampton, Robert Henry, M.R.C.S., L.R.C.P., aged 83.

Johnson.—On March 15, 1949, at The Acres, Heswall, Cheshire, William Johnson, M.C., M.D., F.R.C.P.

Johnson.—On March 19, 1949, in a car accident at Oxford, Brian Ingram Johnson, B.M., B.Ch.

Kent.—On March 16, 1949, Charles Arthur Kent, M.D., D.P.H., of Dover, aged 81.

Lyne.—On March 19, 1949, at 348, Kew Road, Kew, Surrey, Charles Vivian Nunez Lyne, M.R.C.S., L.R.C.P., aged 82.

MacLaren.—On March 17, 1949, Henry Colin MacLaren, M.B., B.Chir., D.A., of 100, Brampton Road, Stanwix, aged 37.

McNair.—On March 7, 1949, at 4, Barrington Crescent, Stockton, David McNair, L.R.C.P.&S.Ed., L.R.F.P.S.Glas.

Martin.—On March 13, 1949, at Manchester, Justin Francis Martin, M.B., B.Ch., D.P.H., aged 36.

Martin.—On March 12, 1949, Alfred Eugene Martin, M.D., of Littlecote, Furze Hill Road, Boreham Wood, Herts, aged 74.

Perkins.—On March 21, 1949, at Tunbridge Wells, Philip Meyler Perkins, M.D., aged 73.

Price.—On March 17, 1949, Clifford Price, M.R.C.S., L.R.C.P., of Homefield, Garratts Lane, Banstead, Surrey.

Steel.—On March 10, 1949, at 32, Roe Lane, Southport, Lancs, Richmond Steel, M.B., Ch.B.

Stewart.—On March 14, 1949, at Princess Beatrice Hospital, Howard Douglas Stewart, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of 10, Broomhouse Road, London, S.W.

Stewart.—Samuel Dudley Stewart, M.B., Ch.B.Ed., of Trinidad, B.W.I.

Vaughan-Sawyer.—On March 9, 1949, at Mount Vernon Hospital, Northwood, Middlesex, Ethel May Vaughan-Sawyer, M.D., late of 131, Harley Street, London, W.1.

Wadham.—On March 14, 1949, at Ryde, Isle of Wight, Frank Jesser Wadham, M.R.C.S., L.R.C.P.

Whitehead.—Recently, at Bridlington, Arthur Ernest Whitehead, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., aged 75.

Whitting.—On March 17, 1949, at Umbrella Cottage, Lyme Regis, Robert Everard Whitting, M.C., M.D.

Yorke-Davies.—On March 11, 1949, at Nakuru, Kenya Colony, John Wynne Yorke-Davies, M.R.C.S., L.R.C.P.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Spread of Tuberculosis by Books

Q.—*Can books handled by tuberculous patients carry tubercle bacilli? If so, are such books, if untreated, dangerous to others, and can they be satisfactorily sterilized at home?*

A.—Although observations on the possibility of spreading tuberculosis by books are not numerous, there is little doubt that when books are used by patients with positive sputum tubercle bacilli are deposited on them in varying amount. The degree to which such books become infected varies widely under different conditions, but from the investigations of Kenwood and Dove in 1915, and later of Roodhouse Gloyne, it may be concluded that at least 50% of the books used by patients with open tuberculosis become infected. Fortunately the bacilli become non-viable in about 48 hours when they are dry, so that Tytler considers that two days after the books have left tuberculous patients only 1 to 5% of the bacilli deposited on them are living, provided no moisture is present. After six days the chances of finding living bacilli are remote. There is therefore a risk to non-tuberculous persons, and particularly to children, in handling books used recently by the tuberculous. The risk decreases rapidly after the first two days, and is also dependent on the habits of the particular tuberculous patient. The danger is, of course, greater if the patient moistens his finger when turning over the pages or coughs directly on to the book he is reading. There is little risk in passing books from one tuberculous patient to another, as any superinfection or reinfection will not be large and will in all probability have no serious effect; but when healthy persons are also concerned all books used by the tuberculous should be kept in quarantine for at least one month before redistribution. To make quite certain that no viable bacilli are carried, books should be disinfected either by exposing the pages to bright sunlight for two or three days or by placing them in an oven for 30 minutes with an open dish of water at a temperature of 95° C.

Nice has shown that books can be sterilized in moist air at 80° C. and with 30 to 40% humidity for 32 hours without causing damage. Sterilization by formalin or formaldehyde vapour is falling more and more into disfavour, as it accomplishes only a surface disinfection and possesses small powers of penetration. It is therefore a possible means of disinfection only with books printed on smooth, shiny paper.

Spread of Infection in Fever Hospitals

Q.—*In most fever hospitals it is traditional to forbid visiting by relatives and writing letters by patients, to disinfect all clothes worn by patients, and to burn all newspapers and magazines. Should this system be modified in view of recent knowledge of the transmission of infection?*

A.—Recent knowledge of the transmission of infection has shown the importance of indirect modes of spread, particularly by infected dust disseminated into the air from fabrics, floors, and fomites. Thus, secondary streptococcal infection among children in hospital with measles or scarlet fever has been associated with gross streptococcal contamination of the bed linen and the dust of the ward. Again, it has been shown that a nasal carrier of haemolytic streptococci will quickly contaminate his clothing, his handkerchief, and his immediate environment. The nose carrier is probably important in the dissemination of other respiratory bacterial infections, such as diphtheria and pneumonia, and possibly of certain virus infections—for example, the common cold. Therefore gross contamination of the patient's clothing or of any material handled by him may be the means of transferring infection to others at a distance, so that the practice of disinfecting clothing and burning newspapers and magazines handled by infectious patients is justifiable, for certain diseases at least. Letters written by patients may be disinfected by formalin vapour. Visiting by children in infectious diseases wards should be forbidden, and only near relatives of dangerously ill or long-stay patients should be allowed to visit. Since, besides the risk of infection to himself, the visitor may be a source of danger to the patient, he should wear a face-mask and gown when visiting.

Notification of Measles and Whooping-cough

Q.—*Does Section 148 of the Public Health Act, 1936 (penalty on exposure of persons knowing that they are suffering from a notifiable disease), apply to whooping-cough and measles, which were made compulsorily notifiable under regulations dated 1940? If Section 148 does not apply, presumably there is some good reason. I shall be glad to have your opinion.*

A.—The regulations set out in Section 148 of the Public Health Act, 1936, do apply to measles and whooping-cough, as to other infectious diseases made notifiable under regulation or Order since the Infectious Diseases (Notification) Extension Act, 1899. The copy of the Statutory Rules and Orders, 1938, No. 1100, which apply to London, clearly expresses the Minister's intention—namely, 1 (2) "These Regulations shall come into operation on the 1st day of October, 1938, and shall be enforced and executed by the sanitary authorities for the purposes of the Public Health (London) Act, 1936." The Regulations (No. 204) were applied to England and Wales in February, 1940, superseding the provisional regulations of October, 1939. Nevertheless, in practice it is usual to differentiate between the dangerous infectious diseases, such as diphtheria, smallpox, and typhoid fever, and the diseases made notifiable subsequently by regulation, such as dysentery, poliomyelitis, and measles, as regards the need for strict isolation during life and pending burial in the event of death.

Umbilical Hernia

Q.—*What is the most efficient treatment for a moderate degree of umbilical hernia in an infant? How long should palliative measures be carried out before resorting to operation?*

A.—In discussing the question of treating umbilical hernia in infants the first point to consider is diagnosis. The true umbilical hernia comes through the centre of the umbilicus and has a "collar" of fibrous tissue from the linea alba that can be felt round its neck under the skin. The supra-umbilical hernia is a bulge just above the umbilicus, and the opening is wide, with thin edges and no collar. The true umbilical hernia will almost invariably close spontaneously—a process that can be much accelerated if protrusion of the abdominal contents is prevented by strapping. Two-inch (5-cm.) inextensible zinc oxide plaster should be pulled across the abdomen to produce a vertical skin fold over the umbilicus; it will stay in position for anything up to a fortnight if kept out of the bath. Placing a penny or a pad under it diminishes its efficiency, and rubber belts are useless, as they never remain in position. The supra-umbilical hernia has no tendency to spontaneous closure, and usually needs operation at the age of 5 or so. Subcutaneous ligation is ineffective in this case, and unnecessary in the true umbilical hernia. An important point in considering treatment is that an umbilical hernia in a child is never dangerous to life, and that the operation may produce a surprising amount of shock.

Peritoneoscopy

Q.—*I should be glad if you would give me references to peritoneoscopy. Is it of value, and what are the risks and contraindications?*

A.—The method has a limited diagnostic value—limited because only certain areas of the peritoneal cavity can be visualized, because palpation is not possible as in laparotomy, and because of the technical difficulties and risks. The latter are not very great: Ruddock reported one death in 1,500 examinations, in this case from haemorrhage following liver biopsy. Previous inflammatory disease may produce adhesions which not only render examination difficult but may anchor coils of intestine to the anterior abdominal wall so that they are exposed to the risk of puncture when the instrument is introduced. Some surgical emphysema at the site of puncture is usual, but is of small import. The likelihood of the formation of adhesions and the presence of acute intra-abdominal infections are the two chief contraindications. Useful descriptions

of peritoneoscopy will be found in the following articles: Hamilton, J. E., *Surg. Gynec. Obstet.*, 1942, **74**, 505; Ruddock, J. C., ibid., 1939, **65**, 623; Hosford, J., *British Medical Journal*, 1948, **2**, 348; Walker, R. M., *et al.*, *Proc. R. Soc. Med.*, 1943, **36**, 445.

Short-wave Diathermy

Q.—*Could you tell me the main uses of short-wave diathermy, and could you also recommend some books on the subject?*

A.—Short-wave diathermy is used to generate heat, which it produces within the tissues instead of transmitting it by conduction or radiation. The heat can be produced superficially or deeply according to the position of the electrodes. As it is not necessary for the electrodes to be in contact with the skin short-wave diathermy is very convenient. All conditions in which heat is indicated can be treated by this method. It is valuable in the treatment of "rheumatic" conditions, of infections, both superficial and deep (as in the pelvis), and of the neuralgias. For further information the questioner is referred to the very full account of short-wave diathermy in Krusen's *Physical Medicine* (1941, Saunders, Philadelphia) and to Kovacs's *Electrotherapy and Light Therapy* (1945, Kimpton, London).

Inheritance of Fragilitas Ossium

Q.—*A patient has just lost her second child, who died from fragilitas ossium congenita. The first child was normal. The mother is young, but nothing is known of her family. The father is also young, and there is no history of a similar case in his family. What is the possibility of subsequent children having this disease?*

A.—This is a difficult question to answer. Fragilitas ossium frequently shows dominant transmission, but skipping of generations is observed in a proportion of families. There is some suggestion of familial incidence—that is, a recessive gene—in certain recorded pedigrees, and sporadic cases appear to be common. There is probably a good chance that this is a sporadic instance, whether due to mutation or not, and therefore that any subsequent children will be normal. On the other hand, in view of the absence of the mother's family history, dominant inheritance with skipping is quite possible. There is also a probability, perhaps, that this is a recessive gene, with the usual 1 in 4 chance for any subsequent pregnancy. It is impossible to calculate any overall chance, however approximate; but on the whole it seems likeliest that subsequent children should be normal.

Myopic School-children

Q.—*It has been customary to restrict close work for school-children with myopia, but I am given to understand that this is no longer considered necessary. Is this true? What is the present position?*

A.—The modification of school work for myopes is still an open question. The problem may be regarded under three heads—the effect on the myopia, the effect on learning, and the psychological effect on the child. The effect on myopia varies according to different observers. A committee considering the "partially sighted child" some years ago found that in high myopia the child who left the myope school was one or two dioptres less myopic than the child who had been through a less restricted training. This seemed to fall in with theory, but unfortunately further investigation showed that both types of patient were equally myopic two years later. In these cases there was no doubt about which group of children were the better fitted for life. On the other hand, a schoolteacher faced with a large class has not always the time to help the lame chick along, and so the myope suffers in crowded schools. The child who is segregated in a myope school will probably get more of an inferiority complex than the myope in an ordinary school, who is naturally a "duffer" at games. These are only one or two pointers which show how complex the problem is and why there is a diversity of opinion about the best approach to it. There is no doubt that the present-day trend is towards the type of teaching from which the patient can derive the greatest amount of educational benefit, the myopic changes being relegated to a position of subsidiary importance in coming to a decision.

Claustrophobia

Q.—*A man of 35 suffers from claustrophobia. He served with distinction during the war, but since his return to civil employment his condition seems to be getting worse—for instance, travelling in the Tube causes him anxiety. Is there any treatment to alleviate if not cure this state?*

A.—This case would appear to be one of an "anxiety state"—that is, a psychological reaction determined on the one side by a susceptible constitution and on the other by some factor of stress in the patient's present situation. Most emphatically there should be an effective treatment. This will depend on discovering the nature of the stress factor, which may need some patient inquiry or may almost lie on the surface. When discovered it may be possible to eliminate it, or at least to reduce its severity. The stress may be due to a combination of circumstances. Many questions arise. Does his job satisfy him? Has he a difficult colleague? How about his home situation—his wife and children? Apart from treatment of the cause, his symptoms may be alleviated by a minor degree of sedation. He could, for instance, take a small dose of a rapidly acting sedative—such as "sodium amytal" 1 to 3 g. (65 to 200 mg.)—before a Tube journey. The advice of a psychiatrist would probably be helpful; but in essence this is the type of problem a knowledgeable and sympathetic general practitioner could deal with on common-sense principles.

Menstruation at Age 56

Q.—*Is it abnormal for a primipara of 56 to be still menstruating? She began her periods at the age of 12. Though now the bleeding is less copious, it is regular and there is no intermenstrual loss. Some hot flushes and headaches occur from time to time, but she is healthy and active, though she has always been obese. Fibroids and retroversion of the uterus have been excluded.*

A.—It is unusual, but not very uncommon and not necessarily abnormal, for the menstrual cycle to continue to a relatively late age. Nevertheless it has been suggested that women who continue to menstruate after the age of 50 are more liable to develop carcinoma of the body of the uterus in later years. In the case in question there seems to be no need for alarm or for active treatment at present. If the hot flushes are menopausal the presence of a granulosa-cell tumour in the ovary is unlikely. The patient should be kept under observation and should be warned particularly to report if the bleeding becomes irregular or if she notices any intermenstrual discharge of any kind. In such an event diagnostic curettage should be carried out.

NOTES AND COMMENTS

Fat Intolerance.—Dr. A. A. BATTSON (Kampala, Uganda) writes: With reference to the question and answer on this subject ("Any Questions?" Jan. 22, p. 164), as a lifelong sufferer from fat intolerance may I suggest that yeast (in tablet form) be tried for this condition? I have recently discovered that two tablets taken with a fatty meal will raise my tolerance to normal levels. By a process of experiment I am satisfied that, for me, this is a fact.

Correction.—Owing to a printer's error the last sentence in the first column of p. 263 of the *Journal* of Feb. 12, in the article by Mr. Norman Emblin on "5,000 Deliveries without Maternal Death," was incorrect. It should have read: "It is true, then, to say that the high rate for the borough in the last decade was not due to the number of maternal deaths in the General Hospital or on the Domiciliary Service, where in the same ten-year period there were 4,389 deliveries with the death of only one woman."

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